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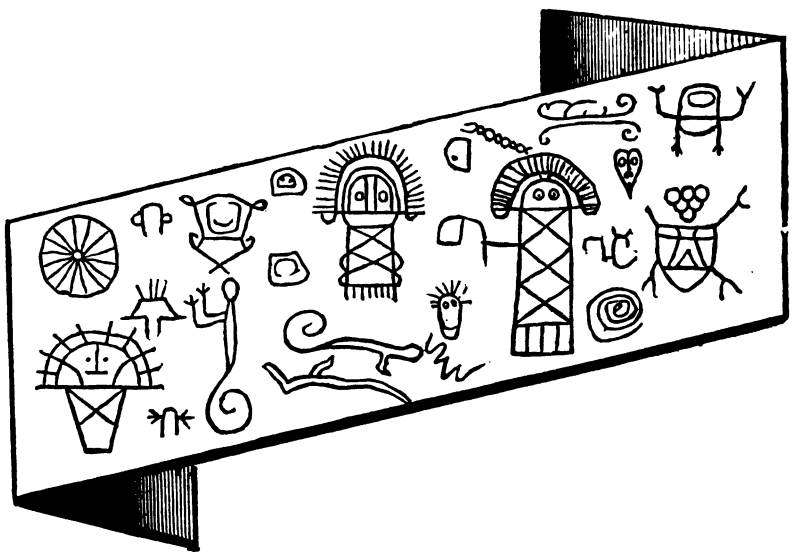

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Redmen; some of their Thoughts.*

By the Editor.

VERY briefly for so wide a subject, I purpose here roughly to suggest, for further consideration, a chief, perhaps the chief, feature in the, naturally very simple, habit of thought of men in one of the earliest yet discernible stages of civilization. The main interest of this particular feature of early thought lies in the probability that from it has developed the very complex habit of thought to which our own race has now become so accustomed that we are apt to overlook the extreme simplicity of the original germ. I shall use in illustration of the primitive stage of thought my experience of our own Indians of Guiana amongst whom I have lived, in some intimacy, now for a considerable number of years.

In a few words I may first re-state the general historic and social portion of these Redmen.

The tract on the north-eastern shoulder of the continent of South America distinguished under the general

* This paper is, in substance, an address delivered to the Torquay Natural History Society in January, 1886, and is printed in *Timehri*, in the hope that it may be of some interest to colonists.—ED.

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name of Guiana, is shared by the English, Dutch and French. From its level sea-coast this country rises, chiefly by step-like ascents, to the table-land of the interior. This table-land is in itself a swelling, grass-covered and treeless open country. But along the courses of the many streams and rivers which rise on this high plain, to flow down the eastward slope to the sea, are more or less extensive belts of trees; and these belts, widening as the rivers themselves widen, approach each other nearer and nearer, till, toward the lower part of the seaward slope, they join and extend as one dense forest over the strip of alluvial coast-land which lies between the foot of that slope and the sea. Through this forest and over the grassy table-land are scattered Redmen of various tribes, but chiefly Caribs, differing from each other somewhat according to their tribes, differing also somewhat according as they live in the open country or in the forest, but, in the main, all in the same early stage of civilization. None of them are aboriginal in those parts; but even those of them who reached their present places latest came before the earliest arrival of Europeans in America. The terrible persecution which, soon after the discovery of America, disturbed, confused, and even obliterated, the previous social condition of the Redmen of the greater part of that coast of America left almost untouched the Redmen of Guiana; for it chanced that the earliest European settlers in these parts were Dutchmen, Englishmen and Frenchmen, who from the first strove rather, in so far as communication and intercourse with the Red-skinned natives was quite unavoidable, to establish friendly relations with these, instead, as was the practice of the Spanish

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colonizers of the adjacent coasts, of enslaving and destroying these. And later, when in those adjacent parts the bodily enslavement of the Redmen by the Spaniards had given place to their equally strenuous spiritual enslavement by Spanish Catholics, the Redmen of Guiana, more fortunate than their neighbouring kindred, were for the most part left simply to their own moral devices. And even to this day in Guiana, except along the sea-coast, which has alone been settled and where missions have been established, almost the sole communication between the Redmen and the colonists is that, of very slight extent, which the former bring about by their own voluntary and rare visits to the Europeanized coast. More than most of their neighbouring fellows, therefore, the Redmen of Guiana have retained their own ideas and habits. These ideas, these habits, and the simplicity of their arts mark them as belonging, certainly not quite to the lowest stage of South American civilization, as exemplified in some of the Brazilian tribes, but yet, taking into consideration the marvellously developed, if still barbaric, civilization of Central America and Peru, to a very primitive stage. It must not be supposed that these Redmen have made no additions to the observations which formed the mental stock of primitive human reason ; yet, despite this gain of many comparatively advanced results of thought, they retain extreme, and in many respects almost primitive, processes of thought.

In order to obtain an instructive parallel, we may compare for a moment certain features in the development of the mental apparatus of the human race with the corresponding features in the development of its apparatus

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of mechanical implements, that is of its arts. It is very reasonable to assume that in a very early stage of development men were provided with none but such unartificial implements as simple sticks and stones. The most remarkable lecture it was ever my privilege to hear was devoted to an attempt to indicate a few of the infinite number of stages, along a few of the many diverging lines of development, by which the simple stick, the implement of the primitive man, has been transformed into countless implements of modern everyday use. We were shown how the stick was added to and improved until it became a bow; how this bow, altering along one line of development, became a cross-bow, which in turn was developed into a gun, that into a cannon, and that, we might now add, into the modern automatic maxim gun; how the bow, altering along another line of development, became a single-stringed musical instrument, how that became a lyre, that a harp, that a spinet, that a piano, and that, we might now add, a vocalion. A very similar lecture might be given though it would naturally be harder to work it out, on the development of many highly complex thoughts, familiar to us now, from the very simple germinal idea of primitive man. All that I can pretend to do is to point out, without attempting to indicate the time which it took in its development, the particular germinal thought of primitive man which is represented in modern thought by our common knowledge of, and even by our scientific classification of, the phenomena of the natural world surrounding us. As in the development of the mechanical apparatus of the human race is the stick of the primitive man to our machine guns, so in the devel-

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opment of the human mental apparatus is the first view which primitive man took of nature to the modern scientific conception of nature.

The basal process of thought, alike of primitive and of developed man, is from the known to the unknown. But it must be remembered—it is somewhat difficult sufficiently even to conceive this, much more difficult to bear it constantly in mind—that to the primitive man 'the known' is an infinitessimally small quantity, is, in fact, almost solely himself and his own feelings. From this, all that is known to him, he has to judge the whole world around him.

Briefly then, the primitive condition of thought of early man concerning the objects, the phenomena, of the natural world surrounding him, such as sun, moon and stars, rains and winds, mountains, rocks and rivers, animals—whether these be human or not—trees and plants, is that there are beings of a nature exactly identical, except in the mere accident, and that as we shall see, a separable accident, of bodily form, and in degree of mental cunning, with the one thing known to him—which is himself.

Let me here state, once for all, that whenever in future I use the word 'being' I use it to express an individual characterized by the possession of that common dual nature, consisting of body and spirit, which is ascribed, in the primitive conception alike to every single natural phenomenon,—with one single exception presently to be noted.

The all-important fact to realize and ever to bear in mind is that primitive man begins his study of the world surrounding him by comparing each object which he sees

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in it with himself and only gradually recognizing differences, as these are forced upon his attention, differences that is from himself.

It has been said that sun, moon and stars merely share, as it seems to the primitive thinker, with men, animals, plants and all other natural objects a common dual nature; and we might at first sight seem justified in stating that in the primitive conception *all* the phenomena of what we call the universe share this common dual nature. There is, however, one phenomenon of the universe which is not included in this primitive view; and this is the earth itself. It is a little difficult briefly to explain the reason of this exclusion. We are thoroughly imbued with the notion that the sun, moon and stars are bodies of an entirely different nature to our own, and that the round earth is of a nature akin to that of the sun, moon and stars. But just as the primitive thinker has not attained the conception of the difference of nature of the sun, moon and stars from our bodies, so neither has he attained the conception of the similarity of the earth to the sun; for the earth is, so to speak, too close to him for him to think about it at all. His conception of the universe—if we may use so sounding a phrase of so simple a notion—excludes the earth, which is to him simply that on which he stands and from which he views the universe. The earth is to him, unlike all other phenomena, not a definite object with body and spirit—not a being.

Yet the primitive man's ideas about the land on which he walks are worthy of some attention, if only for the light which we may thus throw on his habit of reasoning of all unknown things from the thing best known to him.

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That the land extends beyond the parts of which he has experience he takes for granted; for he occasionally, though very rarely, sees other beings come from parts unexplored by him. He has, in fact, never had the slightest occasion to imagine a limit of lands, never any reason to suppose a limit to the land which he knows. It extends, for him, beyond the habitations of the neighbouring hostile Redmen, beyond the mountains, the sea and the sky, beyond all or any of these which happen to limit his own wanderings. Any limit to this extension he neither accepts nor rejects; he simply never questions. He does not himself go beyond the sea, but he occasionally sees other men come thence, and he hears from these of land beyond those waters unpassable to him. Just so he sees an apparently firm sky, separated by an ocean of air impassable to him, and to which he does not know the way, but to which he sees other beings, birds, for instance, and even, as he believes, other men go. Above the sky, as beyond the sea, the river or the mountains, the land, he thinks, extends, open to him if he only dare find the way and go. Their ancestors, the traditions of some Redmen tell them, came from the part of the land which lies beyond the sky, by climbing down a tall tree or a hanging bush-rope; or, in other cases, they came, he hears, from the land beyond the sea, in canoes. One such tradition will serve to illustrate the extreme *naturalness* of these ideas. It is a Warrau tale, which tells how the ancestors of that tribe once lived in the land beyond the sky. There one of them, a famous hunter, one day shot his arrow into a bird, which fell into a deep pit and disappeared. Gazing down into the hole, the hunter saw daylight at the bottom, and before long

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he was able to discern down below a part of the land on which many kinds of four-footed animals were walking. With the help of his tribe he hung a long piece of bush-rope down toward the earth, and then climbed down this. After much successful hunting he climbed home again, taking with him some venison. Now this was a new kind of food to those above, and seemed to them most excellent and desirable. The whole party, therefore, determined to descend. After many had got down safely, a woman, too stout of build, stuck fast in the hole through which the others had passed. Nor though the other members of the tribe pushed from above and pulled from below, was it ever possible to move her. So, the hole being closed, some of the tribe remained in Guiana, while others remained in their original home. In all such traditions, whether the ancestors climbed down from the sky or paddled from the other bank of the sea, the method of travelling is to the Redman equally natural, is just such travel as he himself frequently undertakes nearer home; and the places beyond are simply an extension of the place where he himself dwells. The world, in short, is to him simply his own district.

There are three points in the primitive philosophy thus suggested in outline to which we may next more especially turn our attention. These are, the recognition by primitive man of a dual nature, that is of a body and spirit, in all beings; the necessary recognition of, and accounting for, differences in the bodily forms of beings; and, the corresponding recognition of differences of degree of cunning in the spirits of all beings.

As regards the first of these points, it may at first

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sight seem strange that primitive thought should be capable of the conception of so immaterial a thing as a spirit. Yet but little reflection is needed to bring conviction that it is impossible that man, being rational and having once seen death, should be without this conception. When a man dies, something goes, something is left. The survivors necessarily distinguish in thought between these two parts, and they call them respectively by some such names as spirit and body. A good illustration of this is afforded by the saying of some of our Redmen, as they point out that the small human figure to which they are accustomed, has disappeared from the pupil of a dead man's eye, that "his spirit has gone." This alone is sufficient reason to the Redman for belief in the distinctness of body and spirit—the two parts that separate at death. Nor is it only at death that the distinct existence of these two parts is obvious to the most primitive thinker. To him his dream-acts and his waking-acts seem to differ only in that the former are done only by the free spirit, the latter are done by the spirit clothed in its bodily form. For, seeing other men asleep, and afterwards hearing from the sleepers the things which these suppose themselves to have done when asleep, the Redman can only reconcile that which he hears with the fact that the bodies of the sleepers were in his sight and motionless throughout the time of supposed action, by assuming, by never questioning, that their spirits, leaving the sleepers, played the parts he is told of in dream-adventures. Examples of this have often come under my notice, and I have recorded many of them elsewhere. One may be repeated here. "In the middle of one night I was wakened by a Red-

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man named Sam, the captain or headman of the Indians who were with me, only to be told the bewildering words, 'George speak me very bad, boss; you cut his bitts.' It was some time before I could collect my senses sufficiently to remember that "bitts," or four-penny pieces, are the units in which in that part of the world calculation of wages is made; that 'to cut bitts' means to reduce the number of bitts, or wages given; and to understand that Captain Sam, having dreamed that his subordinate, George, who, by the way, was not present, had spoken insolently to him, the former, with a fine sense of the dignity of his office, now insisted that the culprit should be punished in real life." Moreover, not only in death and in sleep does the Redman thus see evidence of his duality, of body and spirit. The visions which occur to him in his waking hours with a commonness and vividness which in our stage of civilization we can hardly realize, afford further and similar evidence.

Before leaving this part of the subject, one amusing instance of the Redman's recognition of body and spirit in all, even the most unlikely, things may be added. About a year ago, in a part of the country where a white man had never before been seen, after I had lately been sketching, and sometimes drawing faces, animals and so on, for the amusement of the Redmen, the spectators urgently requested me to leave my pencil with them that it might go on making pictures for them after I had left.

Turning now to our second point, it is of course obvious that differences of body must at once be recognized even by the most primitive man. But a great peculiarity distinguishes early thought about this matter from

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the modern view. It is that in the former no limitations have as yet been recognized either to possible differences of bodily form, or to the power of the spirit belonging to each body to change the form of its own body, or even, in the case of some spirits of very superior cunning, to change the form of other bodies.

The Redman realizes no limits to the possible differences of bodily forms. By differences of bodily form, it should be explained, is here meant the exact opposite of what used to be called, or rather miscalled, 'fixity of species.' Till, so to speak recently, the great fact of evolution was learned it was assumed by scientific civilized men that the distinguishing qualities of each species were fixed and absolutely unalterable; now, it is recognized, though the somewhat misleading term, 'fixity of species' is retained for its convenience, that these *specific qualities are in reality variable, but only very gradually and in strict dependence on natural law.* Any real fixity of species, after being long firmly accepted, has now therefore been rejected. Yet in thus accepting variability of species modern science has in no way returned toward the belief of the primitive thinker, which belief is in the variability, *sudden* and *in dependence on no natural law,* of each *individual* being. The unquestioning acceptance by the Redman of the existence not only of animals which he can never have seen, such as elephants, giraffes and kangaroos, when I have described and drawn these to test his powers of belief, but also of perfectly impossible animals, such as the dragons, unicorns, griffins, and the horned, hoofed and tailed devils of our own folklore, when I have described these also to him, illustrates his ready acceptance of the

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greatest imaginable diversity of bodily form. That he equally recognizes no limits to the possible instantaneous variation, at its own or at another's will, or even by chance, of the bodily form of any individual spirit is evinced in many of his tales. Two examples must suffice. The first tells how birds and men once waged combined war on a huge water-snake. The attacking party first agreed that whoever made the first onslaught should claim the skin of the snake as his spoil. For a long time no one would begin; but at last the darter, or snake bird, dived under water and wounded the snake, which was then gradually drawn out and killed by the rest. Then the darter, claiming the skin, called his family and made all take hold of the booty and fly away with it. Then these birds, all of a dull gray colour, agreed to divide the skin, which, except at the head, was of very bright tints, each taking the part that was in its own beak. And when they had done this each dressed himself in his own bit of skin. Most of them —all except the darter who had actually begun the attack on the snake, but to whose lot the head of the skin happened to fall—at once became the various bright-coloured parrots and macaws. Only one, he who began the fight, remained dingy in colour and a simple darter. The second story is again of a war of the birds, this time against the king vultures, who were eventually driven into their own houses which were then burnt over their heads. Then the other birds began to quarrel over the plunder. The trumpet-bird and the heron got so angry that they fought and rolled each other in the ashes, so that the former acquired the gray colouring of its back and the latter became gray all over. Taking advantage

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of the confusion, the owl, prowling about, found a package so carefully done up that he thought it must contain something very valuable; so he opened it, and out came the darkness in which he has ever since had to live. Later, the hawks and other big birds found, that that generally bold little bird the keskedie, disinclined to fight just then, had bandaged his head with white cotton and, pretending to be ill, had remained at home, for which act he was compelled by the big birds always to wear his bandage, as he does, in the white marks round his head, to this day.

The Redman, therefore is utterly without the most remote idea of fixity of species in either of the forms in which that has been conceived by civilized men; so that there is no possibility in this early stage of thought of any classification of beings.

The distinction, then, between the primitive man's conception of differences of bodily form and ours is this. We, even the most unscientific of us, have deeply imbrued in our minds a classification of natural objects according to certain qualities in their bodily form, which qualities, under ordinary circumstances are unchangeable, so that we distinguish, according to certain fixed qualities, a stone from a tree, and both these from an animal, and further, by more minute marks, we distinguish one kind of stone from another, one tree from another, one animal from another; but the primitive thinker, recognizing quite unlimited diversity of bodily form, unchecked by any idea of fixity of species, is utterly unable to form the most elementary classification, and regards each one of the quite infinitely numerous beings which surround him, the essential part of each of which

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is a spirit, as clothed in a bodily form which it can often vary at will or which may be instantaneously varied by accidental circumstances. The primitive man has no means of even roughly grouping the innumerable individual beings which constitute his world.

The third part in this primitive philosophy is the recognition of a difference between various spirits, which difference is, however, merely a difference in degree of cunning. This cunning, it must be understood, is not the immoral form of that quality to which we are most accustomed to apply that term, but rather that praiseworthy cunning, so difficult of perfect attainment, which even in our stage of civilization enables the skilled sportsman to follow, to lure and to capture his prey. The quality, indeed, when thus manifested, in the skill of the perfect sportsman, in a civilized state of society is a distinct and direct survival, in almost full purity, of the one mental quality which, comparatively useless now, was of the utmost, indeed almost of sole, importance to the very life of the uncivilized man. For the latter sees in perfect and fearful clearness, owing to the simplicity of the conditions, the all-involving struggle for existence, in which he, a single individual, has to fight with every other individual, none being armed with any of the weapons, material or intellectual, which in each succeeding stage of civilization so greatly complicate, and at the same time obscure, the great world contest. He sees himself and every other being of the visible world involved in one unending struggle for existence, each with each, each armed only with the one weapon of cunning. That uncivilized man should recognize this one mental quality, it being the one developed,

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and thus indeed essential to his very being, is natural; nor in this stage of civilization has he had opportunity of observing the other mental qualities, which are indeed their, rather, undeveloped mental potentialities. Strange men, wild beasts, rocks and trees in falling, rivers by drowning, diseases always imagined in bodily forms, and the countless other recognized beings ever seem to surround the Redmen, ready to inflict injury by, and only by the one-known weapon, cunning. Bodily size and strength are in themselves of no account. I have known a whole village of some two hundred Redmen thrown into consternation for some days by the appearance in their neighbourhood of one small bird, no bigger than a sky-lark, in which, in some way unknown to me, they recognized the presence of a hostile spirit, powerful in cunning. This dread is less surprising when it is remembered that to these primitive thinkers it seems that each, sooner or later, meets and falls before his superior in cunning; for when the death which comes to each befalls, it is either by violence, in which case it is manifestly the work of a being of superior cunning, or it is by disease—and this, too, is the work of some cunning spirit, which has entered into its victim in the insignificant bodily form, so hard to guard against, of, as often as not, a fly or worm.

It is for this reason that the Redman, feeling his own inability in many cases to circumvent the never-ending, most insidious attacks of these more cunning beings, who are to him murderers—or, to use his own word, kenaimas—ever on the watch to slay, employs the most cunning of his own fellows, who has been deliberately educated in cunning as a peaiman, or

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sorcerer, to circumvent the cunning of the kenaimas.

I have just reached this point in my lecture without feeling with ever increasing force the overpowering vastness of the subject and the consequent hopelessness of attempting more than to suggest, with as little vagueness as may be, a few of its main points. Let us recapitulate these. An attempt has been made to show that the earliest habit of human thought, of reason in its essential features, was a conception of all the innumerable natural objects of the physical world as identical with the one thing known to the reasoner, to man. Differences of bodily form, though unavoidable perceived, were, for reasons already indicated, regarded as without significance. Differences of the spiritual parts of these beings were, for reasons also indicated, regarded as differences only in degree of the one spiritual quality which—I cannot express myself except in very modern phrase—enabled the survival of the fittest in the great and all pervading struggle for existence. It was as though, when reason first arose in man, he looked into a world occupied by innumerable beings engaged in the struggle for existence, each armed with the weapon of cunning and distinguished, the one from the other, only by the varying excellence of the weapon which he thus wielded.

Obviously this earliest mental point of view—I feel the misfortune of having to employ definite words to express a really quite indefinable instant in a mental process—can have endured in full purity but momentarily. Let us seek aid from analogy. As in the development of a photographic plate really simultaneously with the moment of first change in the chemical surface begins,

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all but unobservably but ever advancing, the development of the image, so in the development of the human apparatus of thought, almost simultaneously with the first movement of reason, which is the point, so hopelessly indefinable in words, which I have yet striven to suggest, must have begun that development, that long series of questionings of the reality of this identity of all things with the questioner, and that consequent recognition of real and fixed differences in things which, through long ages gradually affecting and developing the elementary thought of primitive man, has gradually wrought that simple germ into the shape in which we now use it, into the shape, that is, of our modern common knowledge, and even our scientific conception, of natural phenomena, and which, its development still continuing, is hourly and daily leading us to a truer and wider knowledge of the objects of the natural world.

Finally there is an eminently practical suggestion I should like to make about the rather speculative matters just discussed. It refers to the relation which highly civilized folk bear, and should bear, toward the races still in a very primitive condition of thought with whom they are brought in contact in these days of much travel and widely spreading colonization. It should be more clearly conceived than is often the case that the task of the missionaries sent from civilized folk among primitive people—and by missionaries I here mean not only the highly honourable class of religious missionaries but also that other class, wider in that it should embrace the former, of social missionaries—is to adopt those who are only provided with a very

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primitive apparatus of thought—which, by the way, is a very different and distinct thing from the fragmentary apparatus of thought of uneducated civilized people.

Merely to supply the primitive thinker, without further preparation, with the complex apparatus is much as it would be simply to supply folk of a race which has used no implements but sticks and stones with machine guns, grand pianos or any other of the highly elaborated products of civilization.

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The Colony of Surinam.

OUTLINES OF THE HISTORY OF THE ORIGIN AND PROGRESS OF HER POLITICAL ORGANIZATION AND HER LEGISLATION.

By B. E. Colaço Belmonte, LL.D., Graduate of the University of Leyden, Advocate at the Bar of British Guiana.

(Continued.)

ON the introduction of the law before the Chambers, the Ministry expressly and positively declared that it was the intention and the desire of the Government, by restoring to the colony her ancient political rights and privileges, "to lead her to "self-government and to financial independence from "the Mother Country."

But the colony was unfortunately at that time, politically and financially, in a state of transition and inertness; and it was this exceptional position which necessitated some deviations, and prevented the introduction of the system in its entirety. The principle was, however, unalterably written in the law, and the door has been left open for the future introduction of the system in the form originally intended.

It was feared by some of the most sanguine and sincere defenders of a liberal system of government for the colony, that a franchise, in its fulness, might prove detrimental to the colony, sapping the foundations of its dependence, weakening the authority of the local Government, and ultimately estranging the colony from the Mother Country. Of a general suffrage as in 1682, there was never any question. It was neither advo-

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cated, nor demanded, nor wished for. *The electors were to be those directly taxed.* But even this did not offer a sufficient guarantee against the danger of undesirable and incapable members being "sent up to the "States" to represent the colonists, and to co-operate with the Government in conducting the administration of the colony. The door ought not to be opened too wide.

Every person being a Dutch subject or an alien domiciled in the colony, having attained the age of 25 years, and enjoying all civil rights, was eligible. *No ownership of any property, certainly not ownership of or agency for estates or plantations,* (as in days by gone, when autocracy from home and plantocracy had their full sway in the colony and had destroyed her political life and existence) was any longer a requisite or qualification for eligibility. *It was not even necessary to be classed among the taxpayers.* The law showingly centred her entire confidence in the Kiezers; but she, nevertheless, reserved a share in the election for the Government. As has already been said, of the 13 members composing the Colonial States, 4 were elected by the Governor. But even these members, in the performance of their duties and the exercise of their rights, were fully and in every respect the representatives of the inhabitants, *bound by the same oath,* and independent members of the representative body. They were not in any way considered to be members *of* or *for* the Government. Their right to vote was free and unfettered, and they were by no means obliged to submit to the views of the Government. I can here testify that during the 11 years I had the honour of membership of the Colonial States, the Government, since the introduction

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of the new constitution, has never sought for itself any preponderance in the States. The Governor is free and unfettered in his right of election of the 4 members, provided they are eligible in the terms of the Colonial Constitution. But the Government Secretary is uneligible. He may not be sent to a seat in the States, neither by the Governor nor by the electors. The same prohibition affects members of the military service and of the clergy. As a rule, the Government has elected its members from the ranks of the inhabitants, seldom from the Government officials, or, if from the latter, has frequently chosen an independent member of the Bench or Magistrature. Frequently it has elected a member, who had failed to obtain the required majority of votes at a second election. This practice is still continued. There is no prevalence of governmental authority, there is no ascendency or predominance in the States. The Governor himself is never present to advise or give his opinion; he sends his delegates.

As I have already said, the Home Government, in framing the new constitution, relied on the Kiezers. This confidence has, up to this day, not been betrayed. The fear that undesirable members might be sent to the Legislative body has not been realised, and, as a rule, members of the Bench, of the legal and also of the medical profession, and planters and merchants of position have been sent to the House.

Another limitation of the colony's franchise and of the attributes of her Legislative body, was also considered of essential necessity on account of the unfortunate financial position, to which I have already alluded.

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One of the privileges granted to the Colonial States is to vote and to fix the annual estimates, the expenditure of the colony, and the ways and means of raising the revenue. The Budget is annually submitted for the approbation of the States by the Governor, when he opens that body. It is debated, amended or approved of by the States, and promulgated by the Governor as voted by the States. But the vote of the States operates only as a *provisional* Budget. It has to be forwarded by the Governor to the King, by whose order it must be laid, for *definitive sanction* before the Chambers of the States-General, as long as the Mother Country is called *yearly* to grant a *subsidy* to the colony, enabling her to meet her expenditure. It is indeed to be regretted that, up to this day, the colony has not been able to raise her revenue up to her expenditure. Consequently, there is a yearly deficit and a balance on the wrong side, which has to be met by the Mother Country. The strings of the colonial purse are in the hands of the Government at home. This state of affairs re-acts most detrimentally on the colony and its prosperity. It makes her actually entirely dependent as to her finances on the Home Government and its Legislature: it retards progress and condemns the colony to inactivity: it prevents her attainment of such a state of financial independence of the Mother Country and her enjoyment in full of her right of autonomy, which alone can insure her the advantages and benefits of the liberal political organisation and constitution granted and intended in 1865. As long as the colony needs a subsidy from the general national revenue, the yearly accounts of the colony must be rendered, as the Budget, to the Home

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Government and laid before the States-General, for examination and approbation. But as soon as the colony is self-supporting and not in need of any subsidy, the accounts will be rendered by the Governor to the Colonial States, and the interference of the States-General will be at an end.

It depends on the exertions and the energy both of the colonists and of those at home interested in the welfare of the colony, and on the Home Government to hasten a better future for Surinam. Is there lack of energy on the one side; there is certainly want of interest and of liberal feelings and intentions on the side of the ruling powers at Home. It is a positive fact that the Government at Home and the States-General regard the yearly recurring need for a subsidy to the colony, as a burden on the nation; and have proved themselves very illiberal in that respect. The Colonial Budget, as voted by the Colonial States, is yearly, minutely, I dare say, grudgingly, scrutinised and mutilated by the powers at home; repeatedly the items for the most urgent and indispensable requirements of the colony, have been struck from the Budget: and, very frequently, items inserted in the Budget, *pro memoria,* to express the leading opinion in the States, with regard to the wants and necessities of the colony have found no indulgence nor mercy at home.

It is indeed to be hoped that the nation and her representatives will some day recognize the facts of the case. Surinam is a magnificent colony and a most valuable possession of the Netherlands in South America. What British Guiana was and what it is now, will tell the Mother Country what are her interests in Dutch

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Guiana and how they can be promoted. A liberal assistance in her wants and financial distress, coupled with economy in her house-holding, will prove a profitable outlay.

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2. *Judicial.*—The United Provinces of the Netherlands had no codification. The general or common law of the land consisted of local statutes and ordinances, and privileges having force of law. The Roman law was the law of the land.

This was afterwards expressly enacted by the States of Holland by their resolution of the 25th of May 1755, whereby it was stated that, "the Courts of Justice in "Holland, like all other Tribunals in the provinces of "Holland and (West) Vriesland must do justice accord-"ing to the law and ordinances of the land, and also "according to the privileges and old established customs "and usages, and, in failure of these, according to the "Roman law."

The law of the land was however, long before this, worked out by cases and decisions of the various courts and tribunals in the united provinces. The authority of these decisions and the books of eminent Dutch Jurists, and their consultations, constituted, in connection with the general law of the land and the subsidiary Civil or Roman Law, the legislation, the system of law obtaining in the Netherlands, more universally known as the Roman-Dutch Law, until the beginning of this century.

The Criminal law of Holland was contained in the Constitutio Carolina (CHARLES the V.) and the ordinance on the style of PHILIP the II.

The procedure in civil cases was regulated by instruc-

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tions for the Court of Holland and the Supreme Court of Holland and West Vriesland. The procedure in criminal cases was conducted in accordance with the ordinance on the Style, before referred to.

The Court of Holland, also called the Court of Holland, Zeeland and West Vriesland, had jurisdiction in civil as well in criminal matters extending over all the Provinces of the United Netherlands; among other corporations, societies and bodies corporate, the West India Company was subject to the jurisdiction of this Court.

Consequently the civil and criminal law of Holland became the law in those foreign countries of which the West India Company obtained and held possession under the various octroys or fundamental laws and privileges granted by the States-General of the United Netherlands.

And, in this way, the law of Holland, the Roman-Dutch Law, became the general and common law of the colony of Surinam, which, as has been seen in the preceding pages, rested on a special octroy under the rule and administration of the West India Company in 1682, after having been up to that time, ruled and possessed by the Province of Zeeland, where the same system of law prevailed.

Under the fundamental law of 1682, the West India Company had a certain legislative authority in Surinam. It could however not infringe or violate the privileges granted to the inhabitants, or go beyond the instructions and orders transmitted to the Governor by the Sovereign Power at home. The States-General also continued to legislate for the colonies. The W. I. Company exercised its authority by their Committee or Council of

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Ten. The original law of the colony was amplified, altered, and alternately partly abolished and again re-introduced, by a number of ordinances, orders and resolutions, affecting the various branches of legislation. The common law, however, remained as before. History further tells us that, about the year 1761, it was found by the powers in the Mother Country, that the various orders and resolutions, ordinances and placards enacted *in* and *for* the colonies, were so voluminous, conflicting and uncertain, that it was deemed absolutely necessary to order that the orders, resolutions, and enactments which were intended to remain in force should be, *de novo, printed,* and sent to the colony; and that all such orders which should not be *re-printed* should be considered repealed.

Such was the state of the colonial legislation when, in 1815, a new fundamental law was introduced. It brought no improvement. To the contrary, it was enacted that the Courts of Justice should be bound to base their judgments on the "existing laws" (bestaande wetten), and this was the Roman-Dutch law system; but an unsystematic amending, altering of, and amplifying the law by a nearly unbroken line of local ordinances and resolutions, had been ever since encroaching, and, the legislation of the colony, under an irresponsible Government, was uncertain, indefinite and varying with the circumstances of the moment. And this continued under the other Governments, after 1815.

In the meantime, the Codes Napoleon were adopted in the Mother Country to remain in force until the national legislation, promised and guaranteed to the nation, should be completed. The influence of modern

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legislation was speedily felt. Much was organised, and again re-organised, especially in the judicial branch of the colonial administration. The year 1828, under the extensive legislative authority of the *Hooge Raad der Nederl W. J. Bezittingen*, in particular, engrafted new procedure acts, of French origin, on the old colonial law. A complete absence of system prevailed. Legislation was in the hands of the colonial powers, described in the foregoing pages, until the year 1868 when the new legislation for the colony was introduced.

The criminal law remained as before. In 1827, the ordinance of the States-General of 10 October 1798, abolishing torture and regulating the procedure in criminal matters,—but still based on the ordinance of PHILIP the Second,—was re-enacted. In 1830, the law of murder, homicide, manslaughter and wounding of the French Code Penal, then in force in the Mother Country, was partly introduced, but modified and improved.

In 1851 the Home Government, on introducing the Bill, containing a new constitution for Surinam, expressly declared her intention to abolish slavery, and to emancipate the slaves in the Dutch West Indian possessions. In 1855, in her revised Bill for the same purpose, she adhered to her determination. In the interval, in 1853, a State-Commission was appointed to report on the matter, which she did in an extensive and elaborate report.

It was, however, felt necessary that a political and social reform ought to be accompanied by an entire reform of the judicial organisation, and by the framing of a new legislation for the colony.

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The Mother Country, since 1838, enjoyed a national legislation, codified, and, though based on the system of the Napoleontic codes, nevertheless engrafted on the old laws and customs of Holland, adapted to the requirements of the time. The Dutch East Indies had also their codes.

The law of Surinam was still the Roman-Dutch, the old law of Holland, and the Roman law.

In the Mother Country there was certainty, the laws being systematically codified.

In the colony the law was uncertain and in conflict with the laws of the Mother Country. There was furthermore a constant vacillation in the opinion of the Courts, based on the authority of cases and decisions, blended with the conflicting doctrines of the individual authors on the old laws and their endless controversies.

Indeed, the case was even worse than this. The study of the old law of Holland was no longer obligatory, in the *Series lectionum* of the Dutch universities. Members of the profession, graduates of the universities, settling in the colony, as well as the Judges appointed from the Mother Country were no longer sufficiently conversant with the laws and the procedure obtaining in the colony. The Administration of Justice, of course, did not offer the slightest guarantee for the protection of persons, their rights and their property. The influx of modern law principles, and a growing deference to decisions of Dutch Law Courts, based on the modern Dutch Codes—a natural result of such a state of things—rendered the law uncertain, and contributed to a faulty and defective administration of justice, detrimental to individuals seeking justice and to the community at

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large. Apart from all this, the High Court of Appeal from judgments given by the Court of Justice of Surinam was the High Court of the Netherlands, settled at the Hague, with whose members, certainly in the latter years, the study and knowledge of the law and procedure in the colony, was, as with the Bench and the Bar, the exception, certainly not the rule.

There was an entire want of confidence in the law and its administration. A spirit of unrest and a general depression prevailed. The colonial machinery was shaky and unsettled, and capitalists in the colony as well as at home, were deterred from embarking in enterprises which might prove to be of a reproductive character for the colony. The cry for a judicial organisation and a new legislation for the colony was more and more loudly raised; and in 1851 the Home Government declared her intention of remedying the existing evil.

In the Bill for a new constitution and fundamental law for the colony, introduced in the Chambers of the States-General in 1851, it was stated that "it is the intention "of the Government to introduce, *with the modifications* "*required by the local exigencies of the colony,* the "Dutch Civil, Commercial, and Criminal (Penal) Codes, "and the Codes of Procedure in Civil and Criminal "cases."

Shortly afterwards, under the Ministry then in power, a State Commission was appointed by Order of the King in Council of 27 September 1852, No. 46, whose mandate it was "to examine and to report on the Draft-"Codes, composed by order of the Government, with "the view to adapt the Home Legislation to the colony."

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In the renewed and revised Bill of 1855 the Government laid down, in sec. 72, the principle that "the "administration of justice in matters civil, commer- "cial and criminal shall be based, *as much as shall be* "*found practicable,* on the laws and codes in force in "the Mother Country."

New legislation continued to be loudly advocated by all parties. Its introduction was however retarded by various causes and in particular by the fact that the Government had not yet determined in what mode to solve the problem of the day, the emancipation of the slaves, in her Colonies.

In 1857, I wrote of this matter in my Dissertation*:—

The imperative necessity for a reform of the Colonial administrative organisation is universally felt; but it must go hand in hand with the introduction of a new legislation. It needs no comment that great difficulties will arise and uncertainty in the administration of justice will prevail, when a new form of Government which, of necessity, is intimately connected with the introduction of a reformed law system, will be engrafted on the chaotic and antiquated condition of the present Colonial legislation.

But the ministry, at that time (1857) at the head of affairs, was averse to change the colonial constitution; and as the reform of the law had, in its principle, to be laid down in the new constitutional law of the colony, this wished for reform remained, for the time, referred *inter pia vota*.

The year 1859 brightened the prospects of the colony. The new constitutional law remained still in abeyance,

* *De Hervorming van het Rogerings-stelsel in Nederlandsch W. Indie.* (Leiden, 1857.)

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but the Home Government took a decisive step in the matter of legislation. By order of the King in Council of the 28th of December 1859, No 54, a Royal Commissioner was appointed "to proceed to the colony and "there to introduce provisionally, subject to His Ma- "jesty's sanction and approbation the new legislation, "in accordance, *as far as practicable,* with the Home- "laws and with the draft-codes submitted by the Govern- "ment to and revised by the State-Commission of 27 "Septr. 1852, No. 56." Mr. L. METMAN, LL.D., Advocate at the Bar of the High Court of the Netherlands, and ex Member of the States General was the appointed Royal Commissioner.

Previous to his departure for the colony, the Governor of the colony was put in possession of the draft-codes submitted for examination and revised by the aforesaid State-Commission of 1852. He thereupon addressed a circular to the members of the Bench and the Bar, and other officials, under date of the 16th of February, 1860, forwarding copies of said drafts, and requesting the expression of individual views and suggestions to be laid before the Royal Commissioner, on his arrival, in order to further the object of his mission to the colony.

Subsequent instructions despatched by the Colonial Office, at the suggestion of the Royal Commissioner, and approved by the King's Order in Council, resulted in an order of the Governor of the 17th of March 1860, No. 4, whereby a Commission was appointed to "examine "provisionally, the drafts of the State-Commission of "1852 and to assist and co-operate with the Royal Com- "missioner, on his arrival, in introducing the new legis- "lation for the colony."

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The members of said Commission were Messrs. J. W. GEFKEN, LL.D., Attorney General; J. M. GANDERHEYDEN, LL.D., Chief Justice; E. VAN EMDEN, President of the Inferior Court of Civil and Criminal Justice; and B. E. COLAÇO BELMONTE, LL.D., Acting Justice of the Supreme Court of Justice of Surinam.

The Royal Commissioner arrived in the colony in April, 1860, with his Secretary, Mr. H. M. VAN ANDEL, LL.D. Sided and assisted by the Commission, appointed by the Governor on the 17th March before, he at once set to work, on the 4th May, and was satisfactorily progressing towards the completion of his task, when, after a last meeting on the 14th September, his unfortunate and untimely death, on the 5th of October of the same year, put an end to his active and distinguished career, and retarded the introduction of the new legislation.

But the measure was seriously contemplated by the Home Government. On a report of the Ministry, an Order of the King in Council of the 2nd December 1860, No. 66, was issued, by which the Governor of the colony was instructed to invest the Commission, appointed on the 17th of March 1860, with the attributes of the late Royal Commissioner and to add to its members a member of the Court of Policy as junior member. The Commission, then Royal Commission for the new legislation of the Dutch W. Indies, was then constituted by resolution of the Governor of 22nd February 1861, and composed of Messrs. J. W. GEFKEN, LL.D., Attorney General, President; J. M. GANDERHEYDEN, LL.D., Chief Justice; E. VAN EMDEN, President of the Inferior Courts; B. E. COLAÇO BELMONTE, LL.D., Acting Jus-

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tice of the Supreme Court; W. E. RUHMANN, Member of the Court of Policy; and H. M. VAN ANDEL, LL.D., (the late Royal Commissioner's Secretary), as Secretary. The authority of this Royal Commission was, however, confined solely to the framing of the codes, not their provisional introduction. The drafts of the Commission had to be sent home, for sanction and approbation, previous to their introduction into the colony.

The Commission thus appointed held her first meeting on the 10th of March, 1861, and the 8th of February 1867, witnessed her last, the 239th meeting.

The State Commission of 1852, in submitting to the Government its (first) draft (Ordinance regulating the judicial organisation) had stated that it considered the intention of the Government to be that the Home legislation should be the model for the new legislation intended for the Dutch W. Indies, and further that the Commission should only advise departure and deviation from the national codes, where required by local exigencies, and "only such deviations as, without infringing on "their system, were, in the opinion of competent "authorities desirable ameliorations of the existing "codes of the Mother Country."

It appeared, however, to the Royal Commissioner and his (then) advising Commission, on commencing their labours, that the State-Commission had only partly succeeded in realising its intentions. Many local exigencies and requirements had been overlooked.

But the Royal Commissioner, and later the Royal Commission of December 1860, which succeeded him, fully coincided with the intention of the Home Govern-

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ment, expressed in the Bills of 1851 and 1855, and with the views of the States-Commission, that what was intended was *not* to introduce or to adopt, but to *adapt* the Home laws for the colony: a *codification for the Dutch W. Indies*. A digest or *compilation* of the undigested mass of numerous conflicting and contradictory colonial customs, ordinances and resolutions, blended with the uncodified Roman-Dutch law, the Commission considered a cumbrous and ungrateful work, toilsome and laborious, unnecessarily expensive, time-wasting, of no practical or salutary result, and leaving the law of the land in its chaotic state and antiquated and worn-out form. Such compilation or digest was neither wished at Home nor desired in the colony. A compilation or digest, moreover, of the inordinate mass of cases and conflicting decisions of Courts, and of controverted opinions of law authors—all that, in fact, constituted and had brought up the law of the colony,—was also fortunately never contemplated, and a compilation of customs, ordinances, &c., *alone,* was considered at all events, if advisable at all (and it was not) a half-reform, useless, unsatisfactory, and answering no purpose at all.

The practicability of codification was established beyond controversy. Certainly it was so, in a great measure, in the Dutch W. I. Colonies. The Mother Country and the Dutch East Indies had codes: they were the models for West Indian colonial legislation. The actual body of the law of the colony was vague, uncertain, dispersed and scattered: it was almost beyond reach. It had to be rendered simple, clear, concise and certain. The Dutch codes were there: no leap in the dark was feared: the antiquated colonial law-

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system could be, safely abrogated, entirely and without reserve. It was even contended in the private deliberations of the Commission that even if a considerable departure from the system on which the Home legislation was based should prove advisable, and even if the colony and the Commission had not the Home and East Indian codes before them, codification remained practicable. A revision and concentration of what existed and had preceded, in a concise, but systematic and harmonious code of law, though a laborious and burthensome work, was not, if properly and efficiently conducted, beyond the limits of possibility. The models were every where at hand. What was required was the *statement*, not the *making*, of the law: and the sanction of positive law could be given to it by enactment.

All, consequently, were agreed that the codification for the West Indies should be the abrogation of the old law-system and the old legislation, and the introduction in the colonies of the Home laws, but *modified* and *adapted* to and brought into harmony with the exceptional position of the colonies, their local exigencies and requirements. The Royal Commission of Decr. 1860, in framing the codes, which were to be submitted as the result of her labour to the Government, was therefore as far from servile adoption of the Home legislation, or bound by the drafts of the State-Commission of 1852, as she was from condemning ex cathedrâ legal principles and law systems of the old law of Holland and of colonial law-institutes, which had been tested, and had proved beneficial and in accord with the wants of the colony, her social and material interests and the requirements of her population. The great aim was to

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draw the nation and the colony nearer together, to facilitate their commercial connections and business relations. It was intended also to grant to the subjects of the Netherlands in the colony the advantage of living under a legislation and a judicial organisation, similar in system to the legislation and organisation of the mother country and based on the same principles.

In such way and mode, and actuated by such leading rules the Commission of 1860 took up its task, proceeded to fulfil its mission and ended its labours in its last meeting of the 8th of February 1868.

Her Draft-Codes, viz: Civil Code, Code of Commerce, Penal Code, Code of Procedure in Civil cases, Code of Procedure in Criminal cases, and Transitory Law, were then forwarded by the Colonial Government to the Home-Government in terms of the order of the King in Council of the 2nd Decr. 1860, by which the Royal (Colonial) Commission was appointed and invested with the functions of the Royal Commissioner. They were submitted by the ministry to the Council of the State, and, after undergoing certain revisions at Home, sanctioned and ultimately introduced in the colony, under the name of *Codes for the colony of Surinam,* by the Home Executive on the 4th Septr. 1868, to come into force and operation at midnight between the 30th of April and the 1st of May 1869.

In the interval and during the sittings of the Commission the new constitutional or fundamental law for the colonies had passed the Chambers of the States General and became law on the 31st May 1865, as related heretofore. The Government had adhered to her intentions in the matter of legislation, expressed by her in 1851

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and 1855. The introduction of the Home-laws in the colony, but modified in accordance with local exigiences and requirements was secured by Sect. 117 of the new fundamental law, and it was under such happy prospects that the Commission of 1860 continued and ended its labours.

With regard to the dealings of the Home Government with the codes drafted and submitted by the Commission, I cannot abstain from the remark that the powers at home, did not in many respects adopt the views of the Commission. They proved themselves rather too conservative and evidently too much actuated by European impressions, ignoring the real state and social condition of the colony, with her floating and mixed, and only partly civilized population. Uniformity of legislation was advised *to a greater extent*, than the Commission advocated and considered advisable. More than was expedient was uprooted from old colonial institutions, which had stood the test of experience. The Home Government failed to be convinced that there was more of a protective element and more interference of the law, in the interests of private parties, required in the colony, than was wanted in the Mother Country.

Surinam has at present the advantages of a code. The former confusion has ended, and the chaotic state of her local legislation is now a matter of history. The Royal order of the 4th September 1868, introducing the new legislation, enacts as follows :—

The legal authority of the Roman Dutch (old law of Holland) and of the Roman Law is abrogated; all laws, reglements, publications,

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Ordinances, instructions, placards, statutes, customs, and all written and unwritten laws having force of law in the colony relating to matters provided for by the new legislation are repealed and cease to have any force or effect in so far as they are not expressly maintained.

There is now certainty of law and in the administration of justice, and there can be no departure any more from the principle on which the Colonial law-system is now based. Uniformity between the Home and Colonial legislation is for the future secured by the new fundamental law of the colony.

Finality, or a perfect code is to expect impossibilities. Emergencies will arise, new wants may appear, and any code of human origin will require amendments and enlargement. A code cannot be eternal, it will be durable, with occasional readaptations, to meet the progress of society; it will furnish a definite, simple, comprehensible and systematic jurisprudence. It may also diminish litigation.

I am far from contending that, with the advantage of her codes, it is at present in Surinam *pour le mieux dans le meilleur des mondes*. But the foundations are laid for a better future: her liberal constitution, and her systematic codes. The gloom now pervading the prospects of the colony will be dispelled, and the united efforts of the Home and Colonial Government, coupled with self exertion and the energy of the colonists and of those at Home interested in the welfare and prosperity of the colony, will surely and in a short space of time lead Surinam to financial independence of the Mother Country, to entire local self-government and to local self-administration.

The foregoing lines are written in British Guiana. I

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do not wish nor intend to make comparisons, but I venture to say that there is in the foregoing some matter for reflection. The same causes are everywhere invariably leading to the same results. The cure of existing social evils is practicable. The political and judicial history of Surinam, which I have endeavoured, in the preceding pages, to lay before English readers, if I may have any, is there to prove that the remedies are within reach.

Georgetown, 1885.

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Synopsis of the Lycopodiaceæ of Guiana and their Allies.

By G. S. Jenman, F.L.S., Government Botanist of British Guiana.

IN the following paper I purpose to describe, excluding ferns, all the known vascular cryptogamia of Guiana, so far as it has come under my notice. While at Kew last year I turned over the great collection there, which a few years ago was worked out and arranged by Mr. BAKER, for those species gathered by previous collectors which I have not myself discovered in my journeys in the interior. These orders have not before been worked out in Guiana. The fact is, that unless fore-warned by special study, the collector is liable to miss a good many species in his travels. Especially among the Selaginellaceæ there prevails a close general resemblance in the more closely allied plants that is often to the casual observer misleading. The eye, too, does not very readily carry the distinctions even where, on comparing the plants together, they are obvious. Judging from my own experience in collecting, the species which inhabit the belt of country lying between the sandstone region and the sea are generally well known. But we appear not to be so well acquainted with those which inhabit the more elevated sandstone region. In the great alluvial belt alluded to I have found no new species, and those that occupy it are fairly widely distributed. I mean widely distributed locally, for Selaginellas have, in nearly all cases, a relatively very limited range. With regard to the species of the sandstone

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region on the other hand, most of those I gathered a few years ago near the Kaieteur Fall were new, and of the four gathered by Mr. IM THURN since at Roraima, all were new. I infer from these facts that several, possibly many, species still await discovery in that little explored region. The plants of the other orders here treated appear to be better known, for no new species has been turned up by any collector of late years, though a few not before known as belonging to the colony have been gathered.

The contemporary plants of these orders, have no uses of any consequence which enter into the economy of our lives. Some of the species of Lycopodium, where gregarious, are often very abundant, and are useful, when cut, for stable litter or packing material, as a substitute for straw. In these gregarious cases some produce an immense quantity of spores, which rise in yellow dust-like clouds about one's legs and body in walking through the herbage when it is dry. The spores are very inflammable, and those of L. clavatum, one of the commonest and widest spread species, is said to be used sometimes in the manufacture of certain kinds of fireworks. Members of all the genera are cultivated as ornamental plants, most of all the Selaginellas. The capsules of a species of Marsilia are eaten by the natives of Australia (savages of the lowest degree who wander about living on roots and herbage) and they once saved the lives of a party of ill-fated exploring naturalists. The Lycopodiaceæ are of interest for the part their progenitors held in the vegetation of the earth in the past far distant carboniferous age, when, compared to their descendants of to-day, they bore gigantic proportions, as

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the Calamites, Lepidodendrons and other fossil genera of the coal measures attest.

KEY TO THE ARRANGEMENT.

Series I.—*Spores all of one kind.—Microspores.*

Order I.—*Lycopodiaceæ.*

„ II.—*Equisetaceæ.*

Series II.—*Spores of two different kinds.—Microspores and Macrospores.*

Order I.—*Selaginillaceæ.*

„ II.—*Marsileaceæ.*

„ III.—*Salviniaceæ.*

Series I.

Order I.—Lycopodiaceæ.

Stems erect prostrate or pendent, with terete or flattened branches, which are more or less repeatedly dichotomous (except in Phylloglossum), and leafy throughout. Leaves relatively small, often minute, simple or forked, one-nerved, many-seried and irregularly whorled, or, rarely, distichous; usually linear or subulate, close and imbricating or more apart, rarely distant. Sporangia bi- or tri-valved, single, sessile and axillary in the leaves of the normal or modified branches, or in special spikes. Spores of one kind, abundant and dust-like.

Four genera comprise this order, but only two of them are represented in Guiana. The others—Phylloglossum and Tmesepteris—are confined almost entirely to Australia and the adjacent islands, Tmesepteris reaching to California.

Genus I.—Lycopodium. Linn.

Sporangia reniform, one-celled, bivalved, axillary in the normal or modified leaves of the outer parts of the branches, or in the imbricating scales of special spikes. Leaves of one or two kinds, multifarious, rarely distichous or biserial, generally close and often imbricating. Stems and branches mostly terete, dichotomously or pinnately branched, leafy throughout.

These are the true club-mosses, and their aspect, except in a few instances, is very different from that of their allies the Selaginellas, from which they are technically distinguished by having only one kind of spores and spore-cap-

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sules. They number about a hundred species, which are spread over the torrid and warmer regions of the globe, but most concentrated in the equatorial belt. Some of the species range widely in both the old and new worlds. They are divided in their habits of growth into two divisions—terrestrial and epiphytal. The former in Guiana grow in moist ground generally, either open to the direct sunlight or in forest shade. Two or three species, however, appear to prefer well-drained ground. Both are erect, or prostrate in growth, and more or less gregarious. Of the epiphytal, some are strictly pendent, others have a tendency to be pendent with the gradual lengthening of their weak flexible branches, while still maintaining vertical growth. These generally grow in forests on the branches of trees.

§ *Fructification in dense catkin-like terminal spikes.*—Species 1-4.

† *Spikes on long slender stems.*—Species 1-2.

* *Branches flattened, with a distinct upper and under side.*—Species 1.

1. LYCOPODIUM CAROLINIANUM, LIN.—Fl. Brasil p. 115. L. repens, Sw L. affine, Bory.—Stems prostrate, rooting at intervals, extending and shortly branched. Leaves of two kinds; lateral larger and spreading horizontally in a single series on each side, the intermediate in a line with the rachis, to which they are appressed, 3-serial, linear-lanceolate, and much smaller, the former 2-2½ li. l., ½-¾ li. b., linear-oblong, decurrent on the rachis at the base, curved on the upper margin. Spikes 1-2½ in l., on slender distant simple erect stems 3-15 in. l. which are very laxly clothed with small subulate leaves 1-1½ li. l. Scales of spikes ovate-tapering to a spinulose point, the margins often faintly denticulate.

APPUN, n. 1027, Cako Creek. PARKER, Sand Hills. JENMAN, n. 374, Corentyn River; n. 4174, Kaieteur Savannah. Terrestrial in wet swampy ground, on the surface of which the stems extend, the slender terete fertile ones being thrown up stiffly erect at right angles. The minute leaves of the fertile stems are arranged

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in a sub-verticillate manner, and spread a little from the stem. There are no leaves on the underside of the prostrate stems. A very distinct species, that grows in swamps in humus, in which the stems are often found embedded by the fresh deposits.

General distribution.—Madagascar, Hongkong, Ceylon, Bourbon, Mauritius, Florida, Reunion, South Africa, New Guinea, Angola, and Tropical America from the United States to Brasil, but only Guadeloupe of the West India Islands.

** *Branches terete, with the leaves verticillate.*—Species 2.

2. LYCOPODIUM CLAVATUM, LINN.—Fl. Brasil, p. 114. Gr. Fl. B.W.I., p. 646. Plumier t. 165, B.—Stems repent, rooting here and there and branching laterally, 2-3 ft. l. cylindric. Leaves lax, showing the stem freely between. Branches erect, freely again branched, repeatedly so, but not in a dichotomous manner. Densely clothed with leaves, which are in several series, rather stiff, subulate, ¼ li. w., 1½-2 li. l. with a hair-point, incurved. Fertile branches 1-3 in. l., slender, terete, erect, with minute verticillate leaves at intervals. Spikes in pairs or alternate, 2-6 in all to a branch. Bracts ovate-acuminate, attenuated, undulate-margined, somewhat spreading.

A very stiff species both in stems and leaves, but variable in its degree of branching: in some cases lax, in others very dense, and having the branchlets short. The stems of the spikes are several inches high and decrescent in size upwards, and thinly clothed with minute subulate leaves. The spikes have shorter pedicils from ½-2 in. l. The leaves quite conceal the stems of the ordinary branches, though not of the primary and final ones.

General distribution.—Widely spread over most of the tropical and temperate regions of the world; particularly abundant in the West Indies and South America.

†† *Spikes sessile on normal branches.*—Species 3-4.

3. LYCOPODIUM ALOPECUROIDES, L.—Fl. Brasil p. 114.—Stems prostrate

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repent, rooting here and there, branching at intervals and spreading laterally, densely clothed with linear acuminate plain or ciliate edged leaves which form several series, all of one kind, overlapping and more or less spreading, 2-3 li. l. ¼th-½th li. w. Fertile branches, simple, erect, cylindric, 6-10 in. long, clothed like the barren stems but less densely, the leaves rather smaller. Fertile spikes single at the top, the leaves of which are the same in character (not changed into bracts) only longer. Sporangia copious, concealed under the leaves.

APPUN n. 1197, Roraima 5000 ft. IM THURN, n. 146 Roraima. This is a peculiar species, intermediate between the pinnate and dichotomously branched species. It has the habit of growth of the former, but resembles the latter by having its leaves all of one kind. Even the spikes are composed of leaves unchanged only that they are longer. It varies a good deal in the length of the leaves and consequently in diameter (or apparent diameter) of the branches. The unmodified leaves of the fertile portions give this a claim to be placed in the last division. Terrestrial on wet ground, like *L. carolinianum*.

General distribution—United States to Brazil, and Buenos Ayres, but not yet found in the West Indies.

4. LYCOPODIUM CERNUUM, Lin.—Fl. Brasil, 114. Gr. Fl. B.W.I., p. 647. Plumier, t. 165.—Stems cylindric, strong, repent, thinly clothed with small linear-acuminate leaves, and throwing up at intervals erect pyramidal or plumose fertile branches, which are 1-1½ ft. high, with numerous tiers of spreading branches alternate in direction to each other, thus forming the plumose habit; these branches again freely branched with spreading branchlets, which are fertile at their tips. Leaves in several series, dense, not flat, spreading and up-curved, ¼ li. w., 1 li. l. seta-like, main rachis clothed sparsely like the primary stem. Spikes from a line to an inch l., 1-1½ li. diameter. Bracts ovate-acuminate, the margin fringed.

JENMAN, n. 375, Corentyn River; n. 1657, Pomeroon River. Readily recognised by its pyramidal or plumose habit, resembling young fir trees, each branchlet termi-

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nated by a pale coloured recurved catkin. These vary in length in the plants from different countries. In the local state they are from 1-4 li. l. so far as I have seen, but may be in some cases more, as species from Venezuela and Brasil have them in some cases from ¾-1 in. l. It grows both in shaded and exposed places, and on both wet and dry ground.

L. curvatum, SWARTZ, is a stronger species with stiffer and flatter leaves, found in Martinique, Guadeloupe and Dominica and other parts of the world.

General distribution—Tropical and subtropical regions throughout the world.

§§ *Fructification on much modified thread-like terminal branches*—Species 5-6.

5. LYCOPODIUM AQUALUPIANUM, SPRING.—Spr. Mong. Lycop. I p. 68.—Pendent, repeatedly dichotomous, 1-1½ ft. long including the fertile part. Stems slender, 4-gonal, reddish. Leaves flat, spreading, ovate, 4 serial, ¼ inch long 1½ li. w., blunt-acute, the base narrowed in the same way, even-edged. Texture firm ; colour dark green. Fertile portions, 4-6 inches long ; terminal, 2-3 dichotomous, about 1 li. diameter, angular. Bracts folded, keeled, 3-serial, a li. or less l., very acuminate.

APPUN n. 1,388, Roraima. JENMAN n. 1,476, Potaro River, above the Kaieteur Fall, on branches of trees. Readily recognised by the flat, oblong-ovate, spreading leaves, equal at both ends, and firm though hardly stiff slender tassel-like fertile part. The bracts are keeled and folded more sharply than in the next species.

General distribution—Trinidad, Porto-Rico, Guadaloupe, Cuba, and New Grenada.

6. LYCOPODIUM SUBULATUM, DESV.—Pendent, slender, pliant, repeatedly dichotomous, 2-3 ft. l. including the fertile portion. Branches straminеous, angular, 3-gonal, hardly thicker than thread. Leaves 3-serial, often in whorls, spreading, about ¼ in. apart, and always shewing the slender stem between, linear-lanceolate, pointed, the base rounded, ¼-⅓rd

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in. l., 1-1½ li. w. Texture rather flaccid; colour pale or straw green. Fertile branches as long as the barren part, repeatedly forked. Bracts sharply acuminate, keeled. Sporangia copious.

IM THURN n. 230, base of the cliff, Roraima. This species resembles in general aspect that preceding it a good deal, and closely in habit, but is more slender and much more pliant and flaccid, the leaves more apart, narrower and more acuminate, and pale in colour, and it seems to grow very much longer,—no doubt, from the branches of trees. Its general distribution I find I have overlooked, and no books within my reach show it.

§§§ *Fertile branches not modified, but conform with the barren part*—Species 7-13.

7. LYCOPODIUM FUNIFORME, BORY.—Spring Mong. Lycopod. I., p. 50. —Branches long, simple or occasionally dichotomous, pendent or prostrate, 2-3 ft. l. Leaves crowded, several-serial, not spreading, straight and stiff, contracted laterally or convolute, ¼-½ in. l. ¼-½ li. w., freely overlapping, sharp, even-margined. Sporangia reniform, ½ li. w., the lips closed, visible between the narrow leaves.

This species is peculiar for its long tail-like branches, which only infrequently fork, and that reach from 1-3 ft. l. When on trees it is strictly pendent, but it grows also on the ground, in leaf-mould and in other rubbish, and then the stems become constricted here and there and root at the place. The leaves remain fixed in a line with the rachis, not at all spreading, and their convolute condition gives them a very narrow stiff and sharp appearance.

General distribution—Cuba, Porto Rico, Guatemala and Nicaragua.

8. LYCOPODIUM REFLEXUM, LAM.—Fl. Brasil, p. 109. Gr. Fl. B. W. Ind. p. 147. Plumier t. 166. L. reversum, Presl.—Branches erect, from ½-1½ ft. high, repeatedly dichotomous, close and parallel, strong and rather stoutish, ribbed. Leaves plain-edged or faintly serrated, reflexed, ¼ in, l. ⅓rd, ⅛ li. w., broadest at the rather rounded base, linear-subulate,

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crowded, in several series. Sporangia abundant, exposed, reniform ½-¾ li. w., much expanded.

A terrestrial species, growing on open banks and other grassy places. The stems are erect, but as they bifurcate and lengthen they curve and rest on the ground. It is a stiff species, but the stems are not rigid, being fleshy. While green they are 1-2 li. thick without the leaves.

General distribution—West Indies southward to Brasil and Peru.

9. LYCOPODIUM INTERMEDIUM, SPRING.—Fl. Brasil p. 111. L. reflexum, Presl.—Branches slender, ribbed, distantly dichotomous few or several times, reaching 2 ft. long, the divisions relatively few, parallel or spreading more or less, not decrescent. Leaves recurved throughout, 7- or 8-farious, linear-subulate, 2-2½ li. l. ¼ l. w., very laxly arranged on the ribs; margins even or slightly serrated. Sporangia about 1 li. w. reniform.

SCHOMBURGK n. 1192.—A more slender species than *reflexum*, with longer interbranches, and smaller more recurved and laxer leaves. The branches are the same size and the leaves the same length from the primary stem to the ends of the branches. The top of the recurved leaves is turned quite round to the base, and thus they form nearly a circle.

General distribution—Andes of Ecuador, SPRUCE n. 4793.

10. LYCOPODIUM MANDIOCANUM, RADDI.—F. Brasil p. 110. L. dichotomum Hook et Grev. Icon. Fil. t. 22.—Branches strong, leafy from the base, once to several times dichotomous, parallel or divaricating, firm and erect or spreading, ribbed. Leaves 8-farious, close, rather crowded, linear-subulate, straight, or curved, spreading variously,—horizontally, deflexed or up-curved, often falcate, ⅓rd-½ li. w. ¾-1 in. l., even-edged, purple at the base, not decrescent upwards, the outer ones often seeming longer but really not so. Abundantly fertile, the sporangia cordate, much exposed.

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JENMAN, n. 373, Corentyn River; n. 2059 Canje River; growing on the branches of trees. The leaves are very close and spread in various directions, the outer part of the branches often appearing to have longer ones than the inner parts, but it is only in appearance and due to the angle at which they spread. The species is a characteristic one, variable in its extent of branching, with a more or less upright (not pendent) but ultimately, as in *reflexum*, spreading growth. The leaves also vary in width, some plants from this cause having a much finer aspect than others.

General distribution—West Indies and tropical mainland of America to Peru. Also Madagascar.

11. LYCOPODIUM TAXIFOLIUM, LINN.—Gr. Fl. B. W. I. p. 647.—Stems ribbed, leafy from the base, pendent, spreading, or more or less erect, repeatedly dichotomous, from 6 in. to 2 ft. l., primary divisions spreading, or close and parallel as in the final branches, all decrescent or not outward. Leaves close but not crowded, straight linear-acuminate, even-edged, erecto-spreading, several serial, flat, firm but not stiff, 1–1½ li. w., ½–¾ in l. very little narrowed at the transversely attached base. Final branches fertile. Sporangia reinform, copious.

var. *L. passerinoides*, H.B.K. Branches longer usually between the forking, more supple, always pendent, from 1–6 ft. l., decrescent outwards. Leaves of inner stems as large, outer ½–¾ in. l. ½–¾ li. w., all linear-lanceolate; branches fertile often a considerable length.

Nearest *linifolium*, but with much stiffer and thicker stems and firmer stiffer leaves. The habit of the type varies a good deal. Young plants are quite erect, and grow either on the ground or trees, though generally on the latter; older plants have laxly spreading branches, while others again are quite pendent. The primary stems are ⅛ in. thick, and have 5–7 ribs, and consequently the leaves as they are attached to the ribs number the same series. The var. is marked by its

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more uniformly pendent habit, often much greater length, (I have gathered it myself 6 ft. l., though not in Guiana) and branches decresent outwards, while some of its forms touch *taxifolium* on the one hand others pass quite into *linifolium* on the other.

General distribution—Tropical America, both Islands and mainland, both states.

12. LYCOPODIUM GRAMINEUM, SPRING.—Monog Lycopod ii. p. 19. —Branches firm, erect or sub-erect, or at length pendent, repeatedly dichotomous, reaching at length 6—12 inches, the spaces between the forkings 1½—2 or 3 inches long. Leaves crowded, many-farious, erecto-spreading, usually straight, linear-subulate, ¼ to ½ inch long, often slightly falcate laterally, even-edged. Branches parallel or spead-ing. Sporangia copious on the outer branches, reinform, ¼ to ½ li. w.

Collected by DRAKE in British Guiana. This is something like a small state of *passerinoides*, of erect habit and short branches. It is several times forked, but the whole plant reaches only generally 6 to 8 inches high, so that the space between the biturcations is relatively very short. It is a terrestrial species.

General distribution—Guatemala and Ecuador.

13. LYCOPODIUM LINIFOLIUM, LINN.—Fl. Brazil p. 113, Gr. Fl. B. W. Ind. p. 647, Plumier, t, 166, C.—Branches ribbed, very slender, leafy from the base of the primary stem, flaccid, repeatedly dichotomous, pendent, reaching 2 feet long or over, final branches few or many, often very numerous. Leaves lax, 3-serial, spreading, linear-subulate, often rather falcate, ¼—½ or 1 li. w., ½—¾ inch long., herbaceous in texture, even-edged. Abundantly fertile, often from the inner furcations. Sporangia fully exposed, reniform.

APPUN, n. 960, Cucuy Creek. JENMAN n. 1475 Kaieteur Savannah. IM THURN n. 192, Upper slope Roraima. This differs from the two preceding species by its slender, thread-like in size, branches, having the leaves only 3-farious, the flaccid texture, and loosely arranged

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leaves, between which the stem is visible from $\frac{1}{8}$ to $\frac{1}{4}$ inch. *L. passerinoides*, as I have before pointed out, in some of its states comes near it, but in that the stems are never so slender or flaccid, nor the leaves so few in series or so loosely placed on the ribs. The specimen from APPUN, quoted above, has nearly 100 final branches, all developed by repeated forking from a single primary stem.

General distribution—Tropical America abundant, from the West Indies to Brazil.

NOTE.—The following given in Schomburgh's Reisin in Britisch Guiana I have not seen Guiana specimens of :—L. aristatum, H. B. K., L. dendroideum, Spring., L. jussiæi, Desv., L. robustum, Klotzsch

Genus II. Psilotum, Swartz.

Sporangia sub-globose, trilobed, axillary in the minute distant leaves. Branches very slender, repeatedly dichotomous, trigonal or flattened. Leaves simple or bifid.—Bernhardia, Willd.

This small genus consists of only two species, which however make up for the paucity of type in their abundance and wide distribution. They are small and twiggy plants; starting from a simple base, and repeatedly forking till they become a broom-like fascicle of twigs, with distant and very inconspicuous leaves. Only one of them, the commonest, has yet been found in Guiana.

§§ *Branches trigonal.*

1. *Psilotum triquetrum*, Swartz.—Fl. Brasil, p. 133. Gr. Fl. B. W. I. p. 648.—Rootstock composed of few wiry deeply penetrating roots. Stems few inches to a foot long, strong, erect or pendent, cylindric below, ribbed and angular above approaching the first furcation. Branches triquetrous, with sharp angles, repeatedly dichotomous, forming a brush like head, slender, virgate, short and stiff or longer and very flexible. Leaves minute, simple or forked, at intervals in dentations on the edges of the branches. Capsules in the axils of the leaves, 3-lobed.

A more repeatedly branched bushy and stiffer species than the other, easily recognised by the three cornered

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branches. It was first gathered in this country by SCHOMBURGK. It grows on banks, in the fissures of rocks, and between the roots of trees. At the Botanic Gardens, where it has never been cultivated, it comes up frequently in the plant pots.

General distribution.—America, from Cuba to South Brasil; tropical Africa, Asia, and Polynesia.

Order II. Equisetaceæ.

Rootstock creeping. Stems erect, cylindrical, longitudinally furrowed, jointed at intervals, hollow except at the joints, which terminate in a completely circular monophyllous dentate margined sheath. Branches simple, springing through the lower part of the sheaths, whorled and spreading. No distinct leaves. Fructification terminal, on simple stems, in cone-shaped heads, which are composed of several horizontal tiers of peltate stipitate scales that bear on their underside 6-9 pale membranous micro-sporangia that open longitudinally in a slit on the inner side. Spores minute, green, united to elastic wool-like threads (elaters) that are spontaneously irritant while dry.

A single genus represents this order, numbering about thirty species, the principal part of which are spread through the north temperate zone, where they are in several European countries common and well known marsh plants, which in Britain go by the name of horse-tails and paddock-pipes. They form no leaves proper, but these organs are represented by the membranous sheaths of the joints. The branches are produced after the stems have developed, and they grow through the base of the sheaths. There is but one known Guiana species.

Genus I. Equisetum. Linn.

For characters refer to the order.

1. *Equisetum bogotense,* H.B.K.—E. pratense, Hook. E. flagelliferum, Kunze. E. chilense, Presl. E. quitense, Fée.—Rootstock free-creeping, throwing up at intervals tufts of slender, virgate, stiffish shoots, which are 6-12 or 15 in. l. hardly a li. thick; ribs 4-6 or 7. Teeth of the sheaths

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acuminate, dark-coloured, scariose edged, as many as the ribs of the stems. Spikes terminal, ½-¾ or 1 in. l.

Gatherered by APPUN, but his label bears no number or locality. It is a very slender species, with small twig-like branches, which are usually simple from the base, but occasionally are branched verticellately from one or more of the joints. The slender rootstock extends freely in the ground, and the tufts of shoots are thrown up at intervals of an inch or so. The fertile shoots are the same in character as the barren.

General distribution—Abundant from Mexico to Chili.

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The Hurricane of 1830 in St. Vincent; by an Eye-witness.

*Edited by Mary Browne.**

* * * * * * *

THE month of August is considered one of the hurricane months, and although this island had not for half a century experienced anything of the kind (for whilst other islands have suffered materially, St. Vincent has invariably escaped) yet it is usual for all the merchant vessels to leave on or before the 1st of August, otherwise the insurance is doubled. On Monday, the 1st of August, I left Kingston and at 12 o'clock wheeled my horse's head homewards. Passing the Bay of Calliaqua, and which is 3 miles from Kingston, I observed several of the merchant vessels getting under weigh for England. During the preceding week and up to within a short period of its occurrence, we had nothing to indicate the approaching hurricane. On the Wednesday evening it was perfectly still, calm, and serene, and we had taken a drive to Langley Park, as if to take a last look at the beautiful scenery—the luxuriant fields of canes promising an abundant harvest. We remarked on our return that the weather was close and sultry. After midnight the wind began to rise, and with the earliest dawn of the morning, about 5 o'clock, I looked

* This paper consists of a letter, dated St. Vincent, W.I., Nov. 13th, 1831, from a clergyman who was then the owner of "Grand Sable" in that island. It has been placed at my disposal, and edited, by Miss Browne, the granddaughter of the writer—Ed.

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from my window and observed the sea running high, and the smaller boughs of the large almond tree near our house breaking off and falling to the ground, but as the wood is particularly brittle it occasioned me no alarm, From this period the gale increased in strength almost every moment, larger limbs were broken off, the sea began to run mountains high, and to present the grandest and most awful appearance you can well imagine; the waves rising to such an astonishing height that it appeared as if the ocean would swallow up the island, and the wind, blowing in a slanting direction across them, caused the spray of each wave as it broke to be thrown up in the air nearly twice its own height, curling, fretting, and foaming, in vain efforts to oppose the violence of the wind—a complete conflict of the elements. But I was soon called from my brief contemplation of these sublime objects to the nearer danger which threatened us, and to my situation in these trying circumstances, with 700 individuals looking up to me for protection, amongst these the members of my own household—my wife and children—and besides, my residence, the various buildings, my horses, cattle, mules, sheep, and every living thing that might suffer from the violence of the storm, for as yet I had no suspicion that a hurricane was advancing onwards. The first thing that began to awaken my fears was on looking out of my room to observe the overthrow of the carpenter's and cooper's shops. I hastily threw on my clothes, and while doing so intelligence was brought me that the mule and cattle shed had fallen in upon the animals, upwards of 50 in number, and fears were entertained that many must be killed. Down the hill

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I posted, through torrents of rain accompanied by one of my drivers, and on reaching the spot I observed to my surprise, but to my great relief, that the roof had given way in the centre, and as it fell the mules had fled to one end, and the cattle to the other, where they were separately cooped up, unable to move but not having suffered any injury. The sides of bamboo I ordered to be removed so as to admit of their coming out into the pasture, and a pen to be enclosed adjoining an empty megass house (where the canes after the juice is expressed are dried for fuel) that they might take shelter there, as it was composed of substantial brick-pillars, pitch-pine rafters, and a good roof; fortunately however, before my orders could be carried into execution, that building, amongst the ruins of which they must have perished, was itself hurled down by the increasing violence of the gale. As I ascended the hill to look after the security of my own family and the house, which was a frail fabric built of wood, but in a more sheltered situation, another messenger overtook me to inform me that our magnificent wharf which was 290 feet in length and had cost £3,000, was in danger from the height at which the waves were running into the bay, and recommending that measures should be taken to secure the new iron crane placed at its extremity. I despatched two overseers and a company of negroes with directions to fasten the hawser to the crane, and to bring it on shore, and make it fast to a tree, that should the wharf give way we might ascertain where the crane fell and afterwards recover it. I stood at the window looking at this new peril, and to observe how my directions were carried into effect. I saw with an anxious

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eye a wave of unusual size rolling on majestically towards the wharf and crane on its extreme point—they were then both perfect and uninjured—onwards it rolled, mounting higher and higher—it towered far above both crane and wharf—it fell with tremendous violence upon them, and when it subsided the next instant, not one vestige was to be seen. The poor overseer had reached the spot just before, he led the way and had attained the middle of the wharf, when a shriek from the negroes who earnestly besought him to return, as it was giving way, caused him to turn round and speedily retrace his steps, and he did so most providentially, for a foot beyond where he stood the wharf separated, and was in an instant swept into the ocean. The remainder immediately after, with the two storehouses on the beach, following it into the troubled abyss of waters.

But there was no time for reflection. I heard that no lives were lost, and my attention was drawn back to things nearer home. The cloth had already been laid on the table in our large dining-room, and every preparation had been made for our family prayers and breakfast, but the wind blowing in such gusts as to threaten to burst the windows and doors open, we thought it safest to remove all the crockery ware, glass, and other frail materials into the back rooms. We had scarcely done so before our attention was called to one of the north windows which shook violently and appeared as if it were every instant about to burst in. My wife, myself, and two eldest sons in vain exerted our utmost efforts to retain it in its place, but found it overpowering our comparatively puny strength and deemed it wise to make a timely retreat, when the whole frame, window

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and all, burst in, overthrowing the sofa which had been placed against it and falling with violence on the dining-table in the centre of the room. The folding cedar doors on that side of the room then began to shake violently and, bursting the locks and bars, flew open with the greatest violence. We immediately brought two immense boxes I had made to pack my books and linen in, and we succeeded in again closing the doors and placing one box upon the other against them, which resisted the efforts of the wind as long as it continued in the direction of the north-east. Still I entertained no idea of its being a hurricane, and, as the bursting in of the window admitted both rain and wind, we continued with great presence of mind to remove the books from the ledges round the room and bow window in front, and every article of furniture, with few exceptions, into the back room which was separated from that in front by other folding doors. In the midst of our occupation there was a brief lull in the storm for a few moments, during which on looking out I observed a kind of whirl-wind in the air and various light materials carried up to a great height with a rapid spiral motion, and then in an instant after the wind wheeled round to the opposite point of the compass—south-west. This brief lull, this sudden change—were too sure indications of a hurricane to admit of a doubt, and I became sensible of the dread-ful reality ; but without communicating my opinion or my fears to the rest of my family. The former wind from the north-east was a slight gale—a mere sportive breeze—compared to that which now succeeded. It blew, it raged, it raved, it roared ; gust after gust, so awful and so terrific, like the explosion of cannon or the bursting

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of huge waves against the rocks! The folding cedar doors on this side defied every effort to keep them closed —locks, bolts, bars; the table, side-board and sofa that were ranged against them all were swept aside, and they flew open in mockery of our puny efforts and various contrivances, the wind having free course and raging with the fury of a bursting cataract through the opening it had made. Many of my valuable books (you know what pains I took in their collection, and how carefully they have been always preserved), and several articles of furniture were still unremoved when the room began to shake violently and I perceived that all this part of the building must inevitably fall. I stood at the door between the inner and the front sitting rooms, and watching every opportunity rushed forwards, seized an armful of books, retreated to the doors and placed them in the hands of my wife and family to convey backwards and then returned. One mulatto domestic only followed me, and as I sometimes stood half way in doubt whether to proceed, I turned round and saw him trembling from head to foot with fear, and as pale as death. Again and again I darted forwards—closing the doors on my retreat as the gusts rose—and thus I fortunately succeeded in carrying off every book, and most of the furniture. We then aimed for the large dining table, sofa, and remaining chairs; but it was too late. The room began to rock like a cradle, the panes and frames of the windows to crack, and we hastily drew back to the chamber doors, which opened from the inner room, and there stood for an instant at the entrance:—it shook more violently—the rafters, beams, pillars, posts, all gave way and with one tremendous crash, amidst the

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shrieks of the children and the roaring of the elements, the whole of the outer and part of the inner room where we were, fell, and in falling *one part* was driven round against the chamber on the left wing, which it threw on one side forming a fearful opening in one angle where it rent asunder; and the *other part*, consisting of the bow window of the dining rooms and about 5 feet of the building—beams, floor, and all were fairly lifted into the air, and hurled over the hill, leaving in the cellars beneath nothing but the bare walls. We then no longer deemed ourselves secure even in the back rooms; and began to retreat hastily through one of the chamber windows, and over heaps of ruins, to a small pantry which had been recently erected, but was without windows or doors. Here we remained, the rain beating upon us, till we were completely drenched, deterred from seeking security in a cave about 50 yards distant, by the intelligence that the cliff had shot down and closed the entrance. When however I ascertained from my own personal inspection, that it had been only partially closed, by the falling of an immense tree, with a mass of earth and stones attached to the roots, I seized my wife's hand, and followed by all the family (a wretched band of miserable outcasts!) we, after much difficulty in clambering over broken beams, through thatch, sticks, shingles and stones, at length reached it in security, dripping wet, cold, faint and dispirited. We had not tasted anything since the preceding evening, and it was now impossible to think of procuring anything—for the hurricane was at its height—and with mingled feelings of horror and pity, I observed building after building of the most massive materials hurled down; coppered roofs,

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beams, rafters, huge boughs, and even trees themselves hurled through the air with the rapidity of birds in their flight. I saw also many of the poor negroes struggling along the roads, catching hold of the canes, grass or brushwood to support them—sometimes stooping to the violence of the wind, at others compelled to fall prostrate on the ground. All our beautiful fields which had promised an abundant harvest, and the luxuriance of which I had pointed out to a friend only the day before, were levelled to the earth. Here I stood at the entrance, and beckoned to the poor negroes to seek our asylum as the place of greatest security, and as they severally reached us I caused them to pace backwards and forwards in the cave to excite some little degree of warmth, and to avoid the dangerous effects of remaining so long in their wet garments. As the storm decreased in violence, I left the cave with one attendant, and clambering over the ruins of the house, and entering through the chasm in my own chamber, I sought amongst the heaps of rubbish something of refreshment for my poor prisoners in the cave. I succeeded in discovering on a ledge, which, fortunately leaned outwards, two bottles of cordial, (Danish cherry-brandy which had been sent as a present a day or two before), then finding a small mug I retraced my steps and was able to give each individual a cordial draught. This done I instantly descended the hill, the storm abating in violence every moment, and I found our large curing and store house which is 90 feet in length, the extensive cellars beneath it, and the boiling house which is also 90 feet long, perfectly safe and uninjured. I immediately decided upon adopting what appeared to me the most judicious measures under

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all the circumstances of our most unfortunate case. I ordered the doors of the cellars to be thrown open, the dry planks with which they were filled to be placed as seats; the large puncheons of blankets, 50 or 60 pairs which we had brought with us from England, to be opened and distributed amongst the aged and those having young children—and large tubs of rum and water to be prepared and served round amongst them, with a view of reviving their spirits as well as keeping out the cold. In the meantime I ordered all the strong native young men to disperse themselves among the negro houses and fields, and to bring in all the old people, children, and helpless or maimed persons, of which we feared there would be too many! I met at the doors several old persons so completely exhausted that I was obliged to support them; and children I snatched from their mother's arms when they were sinking beneath the load, and hurried with them out of the rain which still poured in torrents. Every moment I expected to hear of some dreadful accident, some tale of horror, or to see some miserable object dreadfully mangled that had been dragged from beneath the ruins of some house, or had been overtaken by some falling rock, beam or tree, or hurried down some precipice or chasm, by the force of the wind. My mind was fully prepared for it, for I did not think it possible that from amidst such universal ruin, every individual of 700 people could have escaped unharmed. And yet Heaven be praised, that Almighty Being who stilleth the raging of the sea, and the stormy wind when it ariseth, and in judgment still thinketh upon mercy, so in pity tempered the storm to the shorn lamb that not one life was lost, not one individual suffered nor sustained the

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slightest injury, nay more, all the cattle, horses, mules, sheep, though in several instances the buildings fell upon them, escaped. Even the little dove, which had been presented to the children a few days before, and whose cage was hanging in the gallery when the house fell, and which we concluded had perished in the ruins, thrust its little head from amidst the thatch where it had remained covered up unhurt for some hours, though its cage was dashed to pieces. Many providential escapes were related to me by the people. One man proceeding up the mountains, was overtaken by the storm, and as he stood by the canal (a narrow cut which leads water to turn the sugar-mill) meditating a return, he observed to his horror and dismay, a tree, torn up by the roots, darting towards him through the air. At that instant he instinctively threw myself into the bed of the canal, and the tree fell across him, just leaving room for him to creep out. A poor crippled woman unable to walk, was seated in her little cottage, when a huge bread fruit tree torn up by the violence of the wind was thrown upon the cottage, but at the same instant the same gust lifted her completely from the ground, carried her out into the adjoining field, where she fell unhurt, and a humane young man who was passing caught her up in his arms and conveyed her to the works in safety. Many parents had their children repeatedly torn from their arms as they were descending, and carried down the hills, where falling or rolling amongst the long grass, canes, and small bushes, they were saved. Others again who had resided in the Bahamas, where they had experienced several hurricanes but none so violent nor destructive, tied their younger children upon their backs,

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and taking hold of the elder by the hands, and occasionally cowering down to avoid the greatest fury of the gusts, thus escaped. It was a subject of mutual congratulation to meet again unhurt, and to be spared the misery of witnessing any lacerated or maimed object, or of hearing of the death of some beloved and dear relative. I endeavoured to impress upon their minds how much cause we had for thankfulness and gratitude to Almighty GOD, for having so spared us, and during the raging of the hurricane, I made all those who were with me in the cave fall upon their knees to deprecate the Divine wrath.

The other estates further north, where the hurricane raged with greatest fury, suffered more both in property and lives, than we did. This I attribute to the peculiar conformation of the mountainous chain through the centre of the island, which at this part attains its highest elevation in the peaks of the Souffrière and the Morne Garou mountains. Between these two mountains there is a considerable opening, down which the wind rushed as through a funnel, or as the bursting of waters through a breach in the side of a canal. The stately and elegant mansion at Waterloo, though all the lower part was built of stone, could not resist its fury. The instant before it fell, Mrs. S. assisted by her brother (for her husband was in town) fled with one little child down the hill; the other being crushed to death in its nurse's arms by a falling beam. In her flight she was followed by the rafters, beams and broken roof, which flew piece-meal in every direction even to the inconceivable distance of half a mile; whilst the child was torn several times from her brother's arms and carried to a great distance; and re-

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peatedly in their descent were they obliged to cower beneath the shrubs from the fury of the blast. They lost 14 negroes, several of whom were killed by the falling of a flight of stone steps, under which they had taken shelter as a place of the greatest safety, and many others were seriously injured. Only one negro house was left standing and Mrs. S. was forced to seek shelter in the dungeon of the estate. I visited this scene of desolation soon after, and the miserable sight which the ruins of the house presented was really melancholy. The materials were scattered around in every direction far and near, just as if meal had been thrown into a basin and quickly turned round by the hand. Here was the arm of a chair, the leg of a table, an organ pipe, broken crockery, window frames, in short no two things together alike; and yet strange to say, though the house was one mass of ruins, and the very room in which the portraits of Mr. and Mrs. SUTHERLAND were hung was an upper room, and both it and the room beneath fell in, yet the pictures were dug out without having sustained the least injury, the burnished and gilded frames as bright as ever, and the oil painting not even scratched. This gave rise to many curious surmises among the negroes who think they must have been witched away. One of the fields of canes which I passed on this estate, and which had been 3 or 4 feet high, was so destroyed that not a vestige of a cane was to be seen, and it bore the appearance of a fallow field in England, recently ploughed and harrowed. On the opposite side of the road, where the canes had been 5 or 6 feet high, a few small stumps discovered themselves, so as to precisely resemble a shaving brush.

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The copper roof of the large storehouse on the beach was, by a sudden gust, literally lifted up whole and carried out to sea, where it sank to rise no more. Mr. S., poor man, who was in town, and little aware of the scene of desolation which awaited him, supposing his house and buildings too substantially built to suffer from the gale such as they experienced in Kingstown, returned home the following evening, a distance of 22 miles, through roads impeded with fallen trees, and masses of earth, and stones which had shot from the cliffs. On reaching our works and noticing the injury they had sustained, he was incautiously informed by an overseer that his own house was levelled to the ground, his works destroyed, not a negro house standing, 14 negroes killed, his child dead, his wife saved with difficulty and lodging in the miserable dungeon where she had taken shelter. He threw up his hands and eyes to Heaven in despair, spoke not a word in reply, but casting the reins upon his horse's neck, galloped onwards furiously as one who knew not, nor cared whither he was going—ruined and desperate.

At Lot 14 nearly all the buildings were destroyed, and the mansion house partly blown down. The family retreated to a small room on the ground floor, where with anxious eyes they watched the progress of the gale, anticipating every moment the separation of the house in two, for it cracked down the middle, and swerved a little to the left.

At Turama, the property of General MACKENZIE, and the residence of Mr. MCLEOD, the sugar-works and other buildings were destroyed and the family mansion was completely swept away down the hill. Mr. MCLEOD'S

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family were in the greatest danger and exposed to the greatest hardships. He perceived from the increasing violence of the gale that the house must give way and kept his eye intently fixed on the stone kitchen (which in this country is always a detached building) as the safest place of retreat, and watched for a favourable opportunity to escape. Just as the house was giving way he rushed to the door, leading Mrs. MCLEOD and his child by either hand and was descending the flight of stone steps when to his dismay he saw the roof of the kitchen coming to meet them; they had just time to get under the arch of the steps and to escape instant death. Here they remained until the wind fairly blew them out, and then though the rain fell in torrents, they were compelled to lie down with their heads against the side of the steps, to avoid the flying beams and rafters which darted through the arch they had just left with the velocity of shot from cannon. As the storm moderated, Mr. MCLEOD took them to the kitchen, now deprived of its roof, and seated them near the dresser,—and being a powerful man, he obtained from the house a mattress, which he placed over them, but from the incessant torrents of rain they were soon seated in a pool of water, to avoid which he once more sallied out and brought another mattress which he placed under them, and there they remained till the hurricane was over. When I visited them shortly afterwards to offer the ladies any articles of apparel from home that they might require, as theirs were either buried in ruins, or covered with mud, I found Mr. and Mrs. MCLEOD, Mr. and Mrs. SUTHERLAND, and the children all seated in a little room, 10 or 12 feet square, without a roof to the

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building, and with nothing but the boards of the room above to shelter them, through which the rain forced its way.

At Langley Park, the residence of Mr. CRICHTON, the canes suffered severely, and the greater part of the sugar works, and other buildings were thrown down, but no lives were lost. Though it was truly melancholy to observe the various appearances of desolation around, yet it was impossible to resist a smile at the droll appearance which the peaked roofs of the manager's and overseer's houses presented; the one was lifted like a cap from the head and perched knowingly on the right side, the other leaning in the opposite direction, as if two dandies had recognized and were saluting each other across the Park with their hats fashionably stuck on one side of their heads. Here an old woman, the conductress of the little vine gang (children who gather vines for the pigs), shewed great presence of mind as well as judgment. They were employed near the skirts of the forest in their usual occupation, at some distance from their homes, when the hurricane came on with its greatest fury. Perceiving the danger to which they were exposed by remaining so near the fallen branches, and that which likewise threatened them of being blown away if they attempted to return across the open plain, she very prudently determined to take them a little distance from the wood into a pasture where there were many shrubs and bushes growing. Here she ordered them to form a compact circle, and each to lie down on the ground and take hold of one of the bushes, in which position she compelled them to remain until the hurricane was over, when they returned home, dripping

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wet indeed but without having sustained the slightest personal injury.

At Owia, the north eastern extremity of the island, a most dreadful catastrophe occurred. Here resided Mr. JOHNSON LITTLEDALE, a brother of one of the Judges of the English Northern Circuit, who on that dreadful morning of the 11th of August, was killed in his bed by the falling in of the house, a greater part of which was blown into the sea. His housekeeper also perished in the ruins, and a daughter had her arm broken. For one whole week, no one could approach their dwelling by land; for the roads had been completely blocked up with fallen trees, and the bodies were committed hastily and without ceremony to the ground by some Carib Indians, who swam across the creek to ascertain what had happened. I might enumerate to you many other melancholy occurrences and several providential escapes, but I have confined myself merely to those in our immediate neighbourhood, where the storm was severest, lest I should fatigue you with the length of my details.

I will now turn to the events which happened subsequent to the hurricane. When it at length subsided, about 2 o'clock in the afternoon, having raged with its greatest violence from 9 to 12, there was a dead calm. The torrents of rain ceased, the dense masses of clouds passed away, the air was serene, and the sun burst forth resplendently as if to shew us a little respite to prepare for the melancholy night which was fast approaching, and to which we looked forward with no pleasing feelings for where were we to lay our heads, and how to provide for its approach. What a singular and melancholy contrast presented itself when we cast our eyes

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from earth to heaven! Above us—the clear blue vault of heaven scarcely intercepted by a cloud, the air cool and calm; below—but how shall I describe the horrors of that sight! the scene of desolation which presented itself mocks all description; materials of the most incongruous description were heaped together in confused masses around us; others strewed over the fields or carried to the most astonishing distances. Scarcely a building of any description was left standing, and even the stone walls and pillars were thrown down. My own residence, the manager's, overseer's, the sugar works, hospital, megass house, cattle sheds, were all either destroyed or seriously damaged, and out of 210 negro houses only 20 were left standing, so that our own individual loss is estimated at not less than £12,000 sterling! The breadfruit, plantain and other fruit trees have been almost entirely destroyed, and the vegetable and provision grounds so materially injured as to threaten us with famine. The trees on the mountain sides, where exposed to the gale, were stripped of every bough and leaf, and left like large maimed blasted trunks, affording no shade to the cattle, and conveying forcibly to the mind the appearance of a raging fire having passed through them, or as if a giant had stalked through the land, and with uplifted arm had swept away with one dire swoop every vestige of human industry. I have observed that such was their appearance only where exposed to the fury of the gale, for such are the peculiar and grotesque forms of the mountains and hills, rising as they do frequently to edges so pointed and sharp that there is scarcely room for the foot to pass, and separated from each other by

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numerous rocky defiles, that the leeward side is only partially affected by a wind blowing in the opposite direction. Riding along the sea coast after the hurricane and looking up these narrow valleys, you would observe one side leafless with bare and whitened trunks while the other side retained its verdant green; like summer and winter occupying the opposite sides of the same hill. When the eye had viewed these scenes of desolation for a while the thoughts naturally reverted to self, and to the situation in which we were left by this awful visitation. Our first object was to obtain shelter for the night; and, as the evening continued fine, I pointed out to the negroes the necessity for taking advantage of so favourable an opportunity to search among the ruins of their cottages for articles of bedding and clothes, and to have large fires made to boil their pots, and to ensure them a comfortable supper. As the evening closed in myself and family took possession of the upper part of the building that had been saved—the store room, where we placed our bedding on the floor. The cellars beneath and other parts of the sugar works were occupied by six or seven hundred negroes, more fortunate in this respect poor creatures than many of the people of the neighbouring estates, who had no roof to cover their heads, and no better lodging than a little thatch raked together under which they crept night after night. As to ourselves, our situation was no enviable one; beneath a burning copper roof, amidst the mingled delicate perfumes of hogsheads of salt fish, sugar, paint, oil, our medicine shop and other agreeables, reposing upon bales of osnaburg and blue cloth, and surrounded by bags of nails, coopers', carpenters', and agricultural

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tools, we remained for a whole month, until our residence was partially restored for our reception. The thermometer being frequently above 90, we were compelled to remain all night with the windows and doors open, which subjected us to the visits of hundreds of bats, and myriads of mosquitoes and ants, all peculiar annoyances in their own way, some stinging, others biting, and the bats dabbing your clothes and linen with their wings dipped in molasses. The first time I occupied this rude lodging, so great had been my exertions and consequent fatigue during the day, that I slept soundly and without waking; but on the succeeding nights, stung by the mosquitoes, and devoured by the ants which crawled in every direction, I frequently started from my broken slumbers, drew on my slippers, and wrapping my dressing gown around me seated myself at the door to catch each passing breeze, or took my usual solitary walks amidst the ruins, to observe that no depredations were committed, and to see that all the fires and lights were extinguished. This was the more necessary as so many inflammable materials, thatch, dried leaves, pieces of wood, lay strewed around in every direction, and the negroes are proverbial for their negligence and carelessness. Nor was the precaution unnecessary from what I observed to occur on other estates. One evening as I was seated at the door as usual, I suddenly perceived in the distance a pillar of fire rise up above the horizon, rage furiously for about an hour and then subside. I wished to proceed to the point of danger, but as the night was dark and the roads obstructed with trees and I was hesitating what steps to take, feeling always anxious to render every assistance in my power, I

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observed that it was evidently getting under, and that I should run considerable risk without any necessity for venturing thither. Next morning I ascertained that it had taken place at Langley Park, Mr. CRICHTON'S residence, who, finding that the mansion admitted the rain in every room, had fitted up a range of outbuildings for the temporary reception of his family and had only that evening completed the thatching of the roofs, taking the precaution before he retired to entreat the domestics to beware of fire, and examined the rooms himself to ascertain that all was safe. A few moments after intelligence was brought him that it was on fire, he rushed out and observed a burning patch on the roof, little larger than the palm of his hand, caused by a servant placing a candle on the shelf too near the thatch. It was barely out of his reach; but in an instant the whole roof was ablaze. Fortunately the night was calm, and the fire rose up in a huge pillar without extending to any of the other buildings some of which were within a few yards. The mansion itself had a narrow escape, for just as the fire died out, the land breeze began to blow from the hills directly on the house; which must have been reduced to ashes had the fire occurred half an hour later. As it was, it produced the greatest consternation among the household, who on the alarm of "fire" being given, leaped from the windows and conveyed the furniture to the lawn in the park. I assure you I viewed the scene, though from a distance, with no little dismay, for fire following upon the calamities we had already experienced, would indeed put a finishing blow to all or any hopes of recovering from our losses.

On another occasion, as we were one evening returning

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from a walk to see what progress had been made in the restoration of our mansion, I perceived a red glare of light on the horizon as of the setting sun. I communicated to my family and to Mr. HARRISON who was with us my fears that another fire had broken out. They thought that it was only the dying rays of the setting sun, but a moment undeceived them. "Look there again, see the deepening glare how it bursts forth—Good GOD, another fire, when will our calamities end? Saddle the horses instantly, lose not a moment, we may be of some service."—I had traversed that morning the road that had been cleared. I felt that I must and would go. My orders were promptly obeyed and the horses were brought round.—I vaulted into the saddle and galloped off with Mr. HARRISON at a furious pace to the point of danger, which we reached after a perilous ride, at the termination of which I found myself when only some few hundred yards from the fire, traversing a deep gully or ravine which a short time before had been a good road, but now washed away into a deep hole. My horse stood still on a sudden and refused to proceed—I dismounted and leaped him up, though when I examined the place next day, I was at a loss to conceive how either my horse or myself could have got there, much less got out again with safety. As soon as I extricated myself from this difficulty, I galloped onwards to the sugar works at Rabacca, where I found a large assemblage of negroes and some white people, most of them looking on in stupid amazement, some giving contradictory orders, others alarmed for their own safety, many and loud voices, but few hands at work and these ignorant how to proceed, one ordering

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what another had just effected. The manager, Mr. CARMICHAEL, who had called upon me in the morning and informed me that his residence had sustained no injury by the hurricane, and congratulated himself on not having suffered any personal loss whatever, was now (so soon and so sudden a change may a few hours make in our affairs) the very person whose property was most in danger. The fire originated in a thatched stable and sheep pen within a few yards from his house, through the obstinacy of an old woman of 80 who had been forbidden to smoke her pipe when so many dangerous materials were strewed around. She had gone slyly into this outbuilding to indulge in the luxury of a whiff once more; a spark fell and all was in a blaze in an instant. On one side were many outbuildings, on the other the manager's house, and close to it an extensive range of sugar works. Time passed—the fire was spreading—all seemed alarmed—but few exerted themselves. The most judicious plan I could think of was to form lines of demarcation round the fire and to enclose the blazing materials within a square, so as to cut off its communication with any other building. I seized a hoe, then a spade and shewed the negroes that I wanted a trench cut all round, into which every relic of the fire was to be thrown, and the square gradually lessened, by some hoeing inwards whilst others brought buckets of water, and baskets of sand to throw on the parts which threatened most. They began at length amidst the din of voices, shouts and contrary orders, to comprehend my plan, and as they not only heard my voice, but saw my own exertions—for I knew better how to handle a spade than any one there, and a hoe as well as most—they

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worked hard, cheered on by the buckras ; and poor CARMICHAEL who himself went about almost demented came to me again and again to thank me for the efforts I was making on his behalf. In about an hour we had so narrowed our square, or rather circle, which form it now assumed, that it became a little mound beneath which the embers were buried. No signs of fire remained, though as a precautionary measure, it was deemed advisable to appoint two watchmen for the night. After some refreshment we remounted our horses, well pleased at what we had effected in so short a time. A night or two after, another fire broke out on a different estate, but as it was only a cottage it began to subside before my horse could be saddled. These repeated alarms made me use every precaution at home. Whenever I awoke in the night, I started up, threw my dressing gown around me, and assuming my large straw hat, with a stick or cutlass in hand, (to seize or frighten any depredators I might discover) I took my solitary rounds. Imagine to yourself a tall figure, with a loose robe, broad hat and glittering cutlass proceeding by moonlight, clambering over broken materials, traversing at one time the long line of sugar works, at another ascending the hill, pacing amidst the ruins of my own mansion, or with folded arms standing on the platform round which my gallery ran, whilst all beneath were reposing in silence, the rays of the moon falling on the ruined buildings and the incongruous masses of trees, stones, thatch and wood which seemed to defy the efforts of men to restore them to order in any reasonable period. These were my regular rounds every night, once or twice, to ascertain that all was safe. Yet sometimes in spite of all my en-

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treaties, persuasions, and threats, I would in the depth of the night hear in the cellar beneath me the sound of the steel and flint striking a light; and then the perfumes of the pipe ascending through the crevices of the floor, conveyed to me the certainty that my wishes had been disregarded. If they heard the least sound of footsteps approaching, all was at once hushed and still, the light immediately extinguished; and when I declared my determination to make an example of those who persisted in striking a light where they were surrounded with planks, staves and shingles on every side, they stoutly and with the greatest *sang froid* denied that there ever had been one, though the place was at the same time filled with such a strong odour of tobacco, as left no doubt of the fact. On one occasion I perceived through the crevices of the door a glimmering light, I approached cautiously and listened, but all was still, I warily opened the door and looked around. Sable forms and dark features laid around me in deep slumber. In the distance was a glimmering taper, and extended at length by it was an old woman, now overpowered with sleep. As I approached I saw that the light proceeded from two wicks placed in the melted tallow at the bottom of the candlestick. They were burnt low, and only within two inches of some chips of wood and close to a heap of boards and planks. I was thunderstruck at the destruction that menaced us, but my presence of mind did not forsake me. I took the candlestick in one hand and placing the other before the light so that I might be able to retrace my steps without stumbling with it among so many inflammable materials, I cautiously sought the door and

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the moment I reached it threw the light to the ground and felt thankful that my steps had been so providentially directed. So far for the occurrences which immediately succeeded or were connected with the hurricane.

I ought now, in justice to ourselves, to proceed to detail to you, would my time or remaining space admit, the methods that we as well as all the neighbouring gentlemen adopted to repair our losses, and to show how, greatly vilified and traduced as we have been as cruel and merciless planters, we consulted the welfare of our negroes before all other objects, leaving and neglecting everything else, even our own residences and comforts, as of secondary moment, until theirs were first attended to; but this I must defer until I next write to you.

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Land Titles.

By Hon. William Russell.

THE conveyancing solicitor who has been accustomed to dive into mysterious boxes labelled "Title Deeds", and has waded through acres of closely written vellum recording the most minute details of every transaction connected with a property from its earliest history, all being carefully scanned and considered before a single rood of the property can be alienated, would be surprised to find in this colony no mysterious boxes, and that the Registrar's office fulfils all the duties of record connected alike with the largest or the smallest property, and that a single deed, costing $16, or £3. 6s. 8d., with the necessary notice in the local press, enables the proprietors to transfer, or burden by deed of mortgage, the whole or part of their land. While this is now the established custom of the colony, it was evidently not the intention of the early Dutch law-makers that the records of the Registrar's office should alone be sufficient proof to warrant the transfer of property. It was clearly their intention, as set forth in clause 6 of the States General's orders of 1792, that a correct chart of all concessions, lands and possessions in the colony should be executed, with the necessary records, and it was for this purpose that acre money was first instituted.

Later on, coming down to the English possession, we find in Ordinance 9 of 1873 the appointment of a Crown Surveyor and Assistant Surveyors, with their duties de-

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fined particularly in clauses 9 and 10, to the effect that a Register Book of all crown lands and forests has to be so alphabetically arranged as to afford a ready means of reference for all land transactions, such record to be always open to the inspection of the public, for the trifling fee of 48 cents. Had the institution of this register been followed up, in 1873, by strengthening the Crown Lands Department, so, as to carry out these clauses in their integrity, including a complete chart of the colony, many of the burning questions which arise as to the titles of land would have been avoided. I allude more particularly to the question which has now arisen in regard to the ownership of the back lands of Plantation *Mocha* in No. 3 Canal.

It may not be out of place to note the various changes that have taken place in regard to the possession of tracts of land or concessions since the first Dutchman landed upon the Pomeroon River in 1580. From the meagre records that are to be found, it is evident that the first settlers formed themselves into village communities, and that they cultivated the surrounding lands for the common weal. These communities must have suffered great privations, the Spaniards harassing them on the land, and the buccaneers closing them in from the sea. By degrees they seem to have found a way to the Massarooni river under the leadership of one JOST VAN DER HOOD, as we find the remains of a small stronghold at Kykoveral Island, at the junction of the Cuyooni and Massarooni, where in 1602 JAN VAN PIERE with his hardy band of adventurers joined the band; with the result that the lands along the Essequibo were soon studded with small settlements.

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At Cartaboo point (the promontory between Cuyooni and Massarooni), the property of the TIERENS family is still to be traced in the foundation of buildings, and various slabs, marking the graves of that family.

The inquisitive pioneer who takes the trouble to search along the sides of the river at this point is sorely puzzled to account for Europeans selecting such thoroughly sterile land on which to settle, judging from the scanty yield of cassava and other provisions now grown by the descendants of the early settlers, who have lost all tinge of the European. To white men it must have been starvation, and the parent country in a deplorable state, before her sons could be forced into such a free exile.

VAN PIERE seems to have had a long reign, for it is evident that he was at the head of affairs when these were removed to Fort Island in 1613; for, in 1621 his name is mentioned in connection with the first introduction of African slaves by the Dutch Government. Fort Island appears to have been the early seat of government of the young colony, as it is there that we find the first authentic records of the country, under the administration of one GRAVESANDE. In 1634 the colony had risen to such importance that a Commander was appointed in the person of J. VAN DE GOSS; from which date a line of Commanders follows until 1742, when L. S. VAN S'GRAVESANDE was appointed to that high position, and under his rule in 1751 the two rivers Essequibo and Demerara were united under one Commander, GRAVESANDE, who held that important post until his death in 1773.*

On the 17th March 1769, there seems to have been an

* A slab in Fort Island church marks the resting place of that able man.

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extraordinary meeting of the Administrative body of the colony under LAURENS STORM VAN S'GRAVESANDE, at which they had before them an application from some adventuresome colonists who wished to embark in the empoldering of land within tidal influence at the mouth of the Essequibo. The Boerasarie Creek seems to have been the starting point of the concessions made that day. The lines granted to JAN BAPTIST STRUVYS embraced 316 roods façade by 1,500 roods in depth, now known as *Zeelugt*. This grant of 316 roods façade evidently embraced the Boerasarie Creek, as shown on the diagram produced on the chart herein after mentioned. *Zeelugt* is now confined to the west bank instead of the east as described in the concession. Another grant made that day was to DANIEL PIEPERSBERG, of 242 roods façade by 1,500 roods in depth, now known as *Tuschen de Vrienden*, and again to HENDRICK MILBORNE, of *Vergenœgen* of exactly the same dimensions as the preceding concession; and so on to the various lots extending along the river. As the wording of these concessions may be considered to embrace the land regulations of that day, we produce that of *Tuschen de Vrienden* at full length.

We, Laurens Storm van S'Gravesande, Director General in and over the Colony and its Rivers Essequibo and Demerary, as likewise Colonel of Militia and Burghers under jurisdiction of the High Mighty States General of the United Netherlands, and Councillors of Policy on behalf of the High Mighty the Honourable the Administrator of the West India Company in Council of Ten Assembled.

Do by these presents grant and permit to Mr. Danl. Piepersberg to take, occupy, and in right of ownership to possess a certain piece of land in the River Essequibo on the East bank, commencing at the uppermost trench of Plantation *Zeelugt* situate on the Boerasirie Creek of the length of two hundred and forty-two roods and a depth of fifteen

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hundred roods, provided that the Grantee shall well and properly cultivate the said lands with such plants as shall be considered most advantageous, also to cause a good and substantial house to be built thereon, without the right, however, to sell or alienate the aforesaid unless with our permission. Reserving to ourselves for and in behalf of the Honourable the West India Company the right of preference as also the right to cut wood on the side lands if required. He shall moreover not be allowed to hinder, molest, or impede the free Indians or casual travellers, and shall deposit in the office of the Secretary of this Colony a land surveyor's certificate of the description of the locality of the land.

(Signed) L. STORM VAN S'GRAVESANDE.

River Essequebo, the 17th March, 1769.

By command of the Honourable the Director General, and the Honourable Members of the Court of Policy.

(Signed) PETER BOUT WONTERS, Secretary *ad inter.*

While this was the condition of matters in the Essequibo, the colonists began to turn their attention to the Demerary river, where adventurers had already taken up some allotments in 1741. Four years afterwards, in 1745, permission was granted by the Chamber of Zealand to recognise those settlements, and to issue grants along the whole river. Commander GRAVESANDE was in charge of both rivers at this important period in their development. From the earliest chart extant of the river Demerary, in possession of the late Dr. MANGET, and the tabulated statements thereto attached, we know the name of the grantee, the area of land granted, and the date of grant; for instance Lot 42, known as ta Huy Ameliœs, now "Amelia's Ward," was granted in 1746 to JOHN HEYLIGER, the same embracing 1,500 acres on the right bank of the river; while Lot 50 known as Christianburg was granted in 1748 to Mr. D'ERVEN CHRISTIAN FINNET, embracing 2,000 acres on the left bank of the river.

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It is evident that GRAVESANDE must have been a commander of great ability, whether his actions were guided by written instructions, of which we have no record, or whether he simply acted on his own judgment. There is strong presumptive evidence that the Commander had very extensive powers given him as to the granting of land; for we find that, in the case of the grants on Grote Creek, large territories were granted, probably to favourites, the boundaries being roughly described as "as far as the tide flows,"; and these titles are still recognised, although the land is only used for timber cutting. The chart in question points to his having been assisted by able surveyors and other advisors, ; it bears evidence that the Demerara river had been carefully surveyed and the boundaries of concessions laid down prior to any having been granted, for the date of the grants are in no way in sequence with the number of allotment; for instance, Lot 1, part of the washed away Plantation "Best" was the last concession given off, in 1769, to JAN JACOB BECKER.

At the death of GRAVESANDE in 1773 the young colony of Demerary had risen to such importance as to call for Courts of Policy and of Civil and Criminal Justice; these were established at "Borslem" an island 20 miles up the river, but in the following year the seat of Government was removed to Stabroek. In 1789 there would appear to have been considerable differences of opinion between the old colonists of Essequibo and the younger branch settled on the Demerary. These differences were inquired into, and in 1789 we find the plan of redress or new constitution for the Government of the united colonies was introduced; and there can be little doubt that along

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with the new constitution, stricter rules were introduced, regarding the mode of settling the lands along the rivers and seaboard, and that the rules and regulations of 1792 were framed about this time. Hence we find Major BOUCHENROEDER engaged between 1795 and 1804 in surveying and laying down a complete chart of the colonies from the Corentyn to the Amakoroo inclusive. VAN COOTER'S chart of the West and East Coasts of Demerary made its appearance; and from the records it is evident that a block, 750 roods in depth by 100 roods in width, had been the stipulated size of grants long prior to the Land Regulations of 1792, as on both East and West Coasts, the lands had been granted and occupied long prior to 1792; thus the regulations in question may be looked upon as locking the door after the steed was stolen. At the same time in the main they seem to have been framed upon the unwritten law which guided the Commander and Council of Ten in assigning the coast lands, which in their nature called for different rules from those suitable for the river estates. For instance, the grand highway by which the river planters transported themselves in their tent boats, and their more clumsy balahoos, with produce to the vessels in the offing, was not available on the coast-lands; hence the introduction of the road clause into the concessions; and the regulations in regard to the maintenance of the roads appear to have been rigidly enforced. The acre money of 3 stivers per acre for front lands has fallen into abeyance, and is now chargeable against the back lands: while the charge of 2 stivers for the back lands appears to have been dropped altogether. With these trifling exceptions the

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orders of the States General in 1792 regulate most of the land in the colony to this day. By the articles of capitulation in 1803 it was stipulated that the laws, usages &c., of the colony should remain as they were before; and, as the regulations already referred to embraced the only written record of the mode of settling the lands of the colony these were engrafted on to the present statute book, and remain unrepealed to this day.

Let us see what these regulations mean from a monetary point of view:—

RELATIVE COST OF GRANTS UNDER THE THREE SYSTEMS OF SETTLEMENT.

Grant of 1769.		
To build a house say		$ 2,000 00
Regulations 1792.		
To build a house	$ 2,000 00	
10 Negroes at $400 each	4,000 00	
Huts for same	600 00	
Construction, Roads and Bridges ...	2,000 00	
Towards general survey, 200 guilders	64 00	$ 8,664 00
Annual charges compulsory—		
Up-keep of roads & bridges, 100 roods	$ 100 00	
Interest on original outlay at 6 o/o	120 00	
Acre money at 3 stivers per acre...	12 00	$ 232 00
Over 250 acres, 92½ cent per acre		
By the Ordinance of 1873—		
250 acres at $10 per acre	$ 2,500 00	
Cost of survey and travelling expenses	86 48	$ 2,586 48

Interest at 6 o/o=62 cents per acre per annum.

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Actual cost of poldering land, 100 roods front dam at $8 per rood	$ 800·00
Drainage and shipping sluice	1,500·00
750 roods side line and middle walk	4,450·00
100 roods back dam	800·00
Back dam koker	250·00
	$ 7,800.00

This amount at 6 o/o per annum = $468·00 or $1·87 per acre, and added to original cost of 62 cents per acre gives a total cost of $2·49 per acre per annum.

This last, without any obligations for acre money or construction and maintenance of roads, bridges &c., &c. The regulations of 1792 are pretty stiff and indicate that before a colonist became a settler he had to have either Capital or Credit, and not simply be a loafer to take up land and sit down in indolence.

A universal cry has arisen against the high rate for Crown lands, but when the above figures are taken into account the cry is untenable, especially as regards alluvial flat soils along our sea coasts and rivers under tidal influence, seeing that these lands when poldered and drained, lease rapidly at from $12 (£2 10) to $24 (£5) per acre per annum. While this holds good of such lands, there are thousands of acres in the interior that would be dear at an annual tax of one cent per acre; hence a distinction ought to be drawn between the two descriptions of land.

It is evident in the face of the various sub-divisions of property which have been allowed by the Government and admitted by the Judges of the Supreme Court, that some law or regulations meeting the various cases of converting by transport, land held only during Her Majesty's pleasure, into freeholds, must be on record.

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At an early stage of the colony's growth this must have forced itself upon the Government of the day, for when Stabroek became too small for the citizens it was natural that the proprietors of the various surrounding coffee estates should part with pieces of their concessions to form a township, even if they had to pay a penalty of £1 sterling per acre in accordance with clause 9 of 1792. One thing is clear, and that is, the descendants of the early concessionists have been fortunate in finding themselves in possession of a township instead of an abandoned coffee estate. If ever an unearned increment was participated in, it was in the case of "Vlissingen;" when an abandoned swamp now partly covered by the Botanical Gardens, was purchased for the public at the fabulous price of fifty pounds sterling per acre.

The formation of villages is another proof of the legal subdivisions of concessions into freeholds; for instance Ordinance 18 of 1845 admits of Daggarad, Mocha and Westfield, on the Essequibo Coast being divided into freehold village lots, the whole being now known as the village of Queenstown. This was the earliest ordinance acknowledging and giving status to village communities, and it has been followed up by various ordinances recognizing and laying down rules for the management of these now freeholds.

Where doubts have existed as to the validity of a title to property, it has been a common practice to allow the property to be levied upon for arrears of monies expended upon roads &c. The property went under sequestration, and was in due time sold, when the owner became the purchaser, got letters of decree, and started fair with a

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clear title; thus shutting out all others who might claim an interest in the property.

A Squatter's Title is recognised as a quasi title to property, and in most cases has arisen from undisputed possession over a long term of years. There are often cases; especially connected with grants, up the rivers, where there is an excuse of papers getting burnt, hence loss of "Title Deeds;" this has been allowed, although there are no good grounds for such action on the part of the Executive, as all grants of land should be traceable through the chart already referred to coupled with the records in either the archives of the Registrar's or Crown Lands Department; any doubts on this head would be removed by strict adherence to clauses 9 and and 10 of No. 9 Ordinance, 1873.

The most important change of all that has taken place in the transfer of land is that due to the contests that have taken place between labour on the one hand and productive capital on the other. A contest which has ended on the side of labour, and which has banished the Anglo-Saxon element, thereby transferring the bulk of the really valuable lands of the colony at a less price than the original cost of constructing roads and bridges into the hands of a class who have neither capital and industry to turn them into any useful purpose; thus a class of pauper proprietors has sprung up on the ruins of the energetic early settlers and is a drag upon the really industrious classes of the community.

The cry is often raised to open up the crown lands of the colony; the colonist who has taken the trouble to make himself acquainted with the length and breadth of the colony knows full well that there are no crown

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lands to open up, all the fertile land is already absorbed.* The greater part of it is fast falling back into a state of nature, through the operation of the foregoing cause. As a forcible example of this, one has only to look at that once grand section of the colony which is embraced between *Golden Grove* and Madawyne Creek on the right bank of the Demerara river, and on the left bank from "Vive La Force" to the Sandhills. With very few exceptions all has already fallen back to primeval jungle. This state of things could never have been foreseen by any of the original grantors; and with the present cry for an altered Crown Lands Ordinance, one of the first clauses should be for the enforcement of the maintenance of the soil in such a state as to minister to the wants of the public; and, concentration being strength; the original intention of the early grantors of having a continuous cultivation should be adhered to, and the most fertile and well watered large territories of the colonies should not be allowed to remain in a state of abandonment.

Such a sound law would soon have its effect; and instead of an indolent race clamouring to have their roads, drainage, and dams kept up at the cost of the industry of the colony, there would be a people who would put their shoulders to the wheel and make an effort to save that on which every negro places great value, "his property."

Mr. LUBBOCK in his paper read at the Colonial Institute instances the exports from British Guiana in 1884 at £2,312,592, of which £190,921 or $\frac{1}{10}$ was other than

* The writer here evidently refers merely to the lands on or near the coast.—Ep.

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sugar. After the liberal way in which the local Government has acted during the last 30 years in attempting to foster other industries, these practical figures ought to point out to those having the welfare and guidance of a rural peasantry in hand, that however unpleasant the name of sugar and sugar labour may be to the vulgar mind, it is to that production that we as colonists have to cling for our existence as a civilized state, and that the small cultivator as well as the large sugar planter should stand shoulder to shoulder in assisting to increase the production of such a money-circulating product, and this can only be brought about by wholesome division of labour, as in other countries; one man growing the raw material, and the other manufacturing it into the finished article.

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*Colonial Jottings.**

By W. C. H. F. McClintock, J.P.

WHEN I was last in New Amsterdam, Berbice, with little or no occupation at that time, a thought struck me that during the few days left before my departure for the sister county my time would be well spent in paying a visit to the Upper Berbice River, and with that object I increased my crew from five to nine Indians.

I ascended the river some distance above all wood-cutting establishments, and until I reached a landing named by Indians "Savanna-land." At this part of the river the forest fringing its banks scarcely extends thirty rods inland, which was a most agreeable surprise to me —for, instead of struggling for hours through a dense forest—as I have frequently done—before reaching the desired object, I landed almost at once on a magnificent savanna, studded here and there with small clumps of trees giving it the appearance of a well kept demesne.

After landing, and burying one gallon of rum, in the hope of having the use of it for my crew on my return to Berbice, I started across the savanna at a quick pace until I reached a tributary of the Demerara River named Mannaca-secaru, which name, in the Arrawack language means dry leaf of the manicole palm—that part of the

* The following notes have been supplied to me at various times by my friend Mr. W. C. H. F. McClintock, so long resident on the Pomeroon River, as Postholder and afterward as Special Magistrate. —Ed.

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leaf which Warrau Indians make use of as wrappers for their cigars: there was only one family on this creek, from whom I hired a corial to convey myself and crew to the Demerara River for the purpose of purchasing a supply of cassava bread &c., &c. The provisions I had brought with me from New Amsterdam were intrusted to six of my crew as carriers, but after I left them they returned to the place I first landed, dug up the rum I had buried in a jug, and on the savanna all six Indians became intoxicated, and fought, and during the fight destroyed all the provisions. But to my great disappointment there was no bread of any kind to be obtained in Upper Demerara River, the consequence being that instead of returning to the Berbice River the following day as first arranged (the distance across the savanna from Berbice to Demerara via "Mannaca-secaru" is only a walk of ten hours) I was obliged to descend the Demerara, as far as Post Ampa, before I could obtain bread and other necessaries for my return journey. On approaching the forests bordering the Mannaca-secaru Creek, a large size tree—which the wind had thrown down--lay across our path. I took it at a jump but knowing that Indians rarely jump when travelling by land, owing, as I suppose, to having loads to carry, I was curious to see whether they would climb on the tree, and then slide off, or walk round by the head of it to rejoin the path; and it was just at the moment of their state of uncertainty I fortunately discovered that a large bush-master snake was underneath the tree, and immediately under the spot I had jumped over. I beckoned to the Indian nearest to me not to climb upon the tree but to walk round it, and to bring his gun—an

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order he quickly obeyed and shot the snake. The Indian in question being "a peaiman" or sorcerer dragged the dead snake some distance into the bush, and there commenced to cut out the fangs which he afterwards secured to the cotton string which supported his loin cloth.

The superstitions of the aborigines of British Guiana are too well known to require any comments from me. A sorcerer, or "peaiman" when armed with the fangs of a snake, more particularly those of a bush-master—is intended to play a very important part amongst his Indian patients, believing as they do, that a peaiman possesses the power of warding off sickness by blowing on the patient through his closed hands, and squeezing the parts affected, while wielding his "sac-sac" or magical gourd. He rails most violently against the evil spirit for inflicting his patients with sickness, and, while extolling his professional skill as a medicine man, does not hesitate to assure his patient that his recovery is certain. Finally he exhibits to the credulous patients the fangs of the much dreaded bush-master snake, which he tells the sick Indian he took out of his body, all of which the poor benighted Indian firmly believes. As a rule it is only the Indians who live on, or in the neighbourhood of, the Missions, who will take our medicine; but they require much nourishment while under our care, as our medicine is so much stronger than the Indian bush remedies. Missionary efforts have accomplished wonders amongst the Indians of this colony; but in the more distant parts rarely visited by missionary, the voice of the peaiman reigns supreme.

It was during the rainy season I walked across from river to river, and seeing the banks of Demerara

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full to overflowing, a thought struck me that by making use of a woodskin instead of a batteau or corial, I would be able to perform the journey from "Mannaca-secaru" Creek to Post Ampa in two days instead of three days,—the time usually occupied by travellers. In the hope therefore of making the journey agreeable, and for other reasons, I hired a woodskin and two Indians as paddlers, who knew the short cuts, for my track then lay not in the river but through the forests. By adopting this course all the windings of the river were avoided, which materially shortened the journey, reducing the time occupied in travelling to thirty hours instead of three days.

I was delighted with the appearance of the country I passed over. The clumps of trees scattered through extensive meadow-like tracts of land, covered with rich vegetation of sweet grass and a variety of flowers, brought vividly to my recollection many park-like places I had seen in the old country, and I felt assured that if the lands lying between the rivers Berbice and Demerara were in the hands of persons of experience they would soon be turned to profitable account either as cattle farms or for agricultural purposes. I felt so much persuaded to this opinion that I jotted down in my note book the following remarks made at the time:—"The tract of land lying between the river Berbice and Demerara is, in many respects, better calculated for colonization than any other part of British Guiana; first, and chiefly, the healthiness of upper Berbice River is proverbial, the river water throughout the year, is pure and wholesome; again the savannas are extensive, and their formation, generally,

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undulating, would save expense in drainage; much of the land is rich, well watered, free from forest, and ready for the hand of the ploughman; the land would yield coffee, cotton, and tobacco, besides being well adapted for pasture or for agricultural purposes. The Indians inhabiting the district referred to (with whom it would be absolutely necessary that settlers should live on the most friendly terms) are far advanced in civilization, industrious and most efficient in the art of squaring timber, and as there are several wood-cutting establishments already high up the river they would afford great accommodation to such of the settlers as might prefer disposing of their materials, on the spot, to conveying them to the town of New Amsterdam for sale, a distance of more than one hundred miles from the part of the river on which the settlers would be located. The trees which line the banks of numerous creeks of the upper Berbice are of the most valuable description, and, in great abundance, would, at all times, afford the settlers constant and lucrative employment. This, coupled with the advantage of transport free from difficulty or danger (craft intended for transport service might load near the spot the trees are cut down) would advance the value of the tract of land, to which allusion has been made as being particularly well suited for such persons as feel disposed to try their hands at small industries."

The soil in several parts I visited was rich and eminently qualified for the cultivation of coffee and tobacco; and the soil of the savanna to which I have already alluded is equally rich as the hills of the Moruca River where, at the present day, Spanish Arrawack Indians continue to cultivate coffee with every success, and until recently tobacco

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also, which they made into cigars and afterwards sold them for twelve dollars a thousand.

The soil of the numerous hills of the Waini and Barima Rivers is rich, consisting of ochreous clay intermixed with some mould and gravel, and almost the best kind of soil for the cultivation of coffee. The coffee at present growing on Conuballi Hill, in the Waini, and again on the hills of Moruca River, and also on Cabacaburi mission, Pomeroon River, is the best proof I can offer in support of what I have stated respecting the superior quality of the soil of the elevated sands of those rivers.

I had occasion, in a previous communication, to remark that a Mr. S., a traveller had visited Pomeroon river, and had extended his journey to the Waini. Mr. S.'s letter of the 15th April, 1829, gives me to understand that on his return to Pomeroon he found it necessary to write a "sharp" letter to the Post-holder of Pomeroon in answer to some unfriendly remarks the Post-holder was reported to have made about the traveller; but without entering into particulars the apparent coldness between the two men may be told in few words as follows :—

The Government of that day under General MURRAY, afterwards under General D'URBAN, attached so much importance to the arrival of Spaniards to settle in this colony that instructions were sent to the Post-holder to watch over them, and to forbid all unnecessary interference with them by travellers or by any other persons; indeed, that persons wishing to travel through the north-west district of the colony must provide themselves with passports. Mr. S. being looked upon as a spy, and lest his mixing among the Indians of Moruca, &c. should

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have the effect of unsettling their minds, the Post-holder considering that Mr. S.'s conduct was diametrically opposite to the orders he (Post-holder) had received from Government, and wishing to correct the traveller from mixing too freely with the Spaniards, the Post-holder making use of language to that effect caused a misunderstanding between the two men. All this care and protection on the part of the British Government towards our new arrivals exasperated the Oronokers so much that during my time, even, reports were circulated amongst the Spanish Arrawaks that large-sized launches from Oronoko manned by Spaniards were expected in Moruca —brought up for the express purpose of taking all of them back again to the Oronoko; hand-bills were also distributed among the Moruca people offering to each person who returned to Rio Oronoko a supply of implements of husbandry free of cost; but no offers had any effect nor was it to be wondered at when it is known their escape from Rio Oronoko was to avoid military duty for which they were now called upon to serve, and without pay or clothing and rations very irregularly distributed; the result was that they refused to a man to return, stating they were already established in Moruca and under the protection of the British Crown.

I am come now to a very painful circumstance—the spread of leprosy among the Warrau Indians—proving beyond a doubt that the disease is infectious, although there are many physicians, at the present day, who deny the fact.

The Government of that distant period could not have imagined that leprosy was contagious, otherwise the un-

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fortunate creatures would not have been sent to the Pomeroon Post. The Post-holder being a Government officer, it was thought the lepers would be better looked after and their wants better supplied, which I am sure was the case; but look at the sacrifice! Until I had taken the census of the whole district, namely—Pomeroon, Moruca, Waini, Barima and all their tributaries I was ignorant of the extent of the disease; but having visited each Indian settlement I couldn't longer be deceived. Pomeroon being considered the most important outpost in the colony, the Government of that day supplied the post-holder with a sailing boat, which, as I'll shortly explain, was found to be very useful; besides a crew, monthly, of fifteen Warrau Indians. As the lepers were not kept separate, the intercourse between them and these Indians was of frequent occurrence, and the spread of the disease is not to be wondered at. The Indians were to cultivate plantains and other vegetables, at the same time to be at the beck and call of the Postholder whenever their services were required as boatmen.

The utility of supplying the Postholder of Pomeroon with a sailing boat will now be explained :—

JOHN COZIER, (Dutch), whose appearance was distinguished by his wearing a double night cap made of red woollen yarn. When the cap was opened and stretched to its full length it measured fifty inches. Part was applied as a covering to his head, the remainder was used as a covering to his face to protect him from mosquitoes. On one occasion, a Spaniard ascended Pomeroon in his launch, as high as "Hope and Success," JOHN COZIER'S property, then under cotton cultivation.

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The Spaniard seeing the driver of Hope and Success, arranged with him to convey all JOHN COZIER'S gang of slaves, seventy in number, to the Oronoko. The driver was quite agreeable to the arrangement, and during a Sunday night all hands were taken on board, and proceeded to the Waini River. JOHN COZIER missing his people proceeded to the Postholder and related the circumstance to him; he the (Postholder) manned his sloop and followed the launch which, with all the negroes, he found on the shell bank at the mouth of the Waini. The Postholder after securing all hands proceeded to Georgetown and lodged the negroes and Spaniards in the Georgetown Jail. In those distant days jail fees were very high, and JOHN COZIER, on that account, could not release them as soon as he wished; but when he did succeed he took his slaves back again to Hope and Success, but fearing another escape he purchased Uitvlugt Estate, Demerara River, and put them on it—leaving Hope and Success in a state of abandonment for more than fifty five years.

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Rice.

By the Hon. W. Russell.

IT is scarcely necessary to dwell upon the importance of a cereal which feeds three-fourths, I think, of the entire population of the world, or to remind the members of this Society of the important part it plays in feeding a large bulk of the inhabitants of this colony, calling for no less a sum than £223,284.17.3 to be transferred from this colony to India in payment for this food supply. My purpose is to trace out the various steps taken to grow a home supply here, where both soil and climate are apparently more favourable for the plant than in any other part of the world.

In the year 1848 I first saw rice growing, in Berbice; and it affords the best illustration that I can give of rice cultivation on upland. I had been in pursuit of game on the 1st of August holiday, and the dogs gave tongue, indicating that the quarry was at bay in a high bullet tree reef; so with the "yackman," I made for the scene of yelping, and to my astonishment after struggling through a considerable distance of tangled bush I came upon an opening where a lovely green crop, something similar to an oat-field, met my view. The "yackman" himself, an African, at once pronounced it was rice, and told me that this was the labours of the "Timini" people, a race of Africans introduced by Messrs. Laing from New Providence, Nassau. Following up, we found a huge ant-eater backed up against a tree stump, keeping

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the dogs at bay. My companion soon made short work of the ant-eater, saying it was good meat. Everything is meat to the African huntsman. I now gave attention to the mode of planting this, to me, new plant; and in my after travels in the forests of the interior, I have seen ways of land tillage reminding me of those practised by the Timini rice growers. The forest is felled, all except the huge giants, and then after junking the branches and scattering them over the surface until they are dry, a fire is set, and the whole consumed except a few stumps and the larger pieces. The land in this condition is tickled with a pointed piece of hard-wood, or more generally by the never absent cutlass; a few grains of seed are dropped into holes, which are roughly covered up; and this is the whole work the husbandman bestows upon the land to cause it to produce an abundant crop of rice, maize, ochroes, pumpkins, and the various legumes, such as pea, bonavist, &c., &c. Such had evidently been the cultivation bestowed upon the rice fields in question, which must have been planted to gain the summer rains of June and July, and were then in August almost ready for the sickle.

Having reported my find to the managers—we had even then dual control—they were much interested in this work of industry on the part of the Africans, who had thus provided themselves with a food supply, at the cost of so little labour; and there was much talk about spreading the industry. The time came for reaping the rice, but unfortunately at the same time the cane fields required to be cut, and the rice cultivators could not be made to see that Massa's canes came before their rice. The consequence was that not only the rice growers,

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but the whole gang became disorganized. They stowed away the rice, tied in bundles over the collar beams of their cottages, until one or two fell in, and there was the mischief to play all round; and what was a short time previously considered a grand industry was now denounced as a perfect curse; for, African-like, while the rice held out, it was a case of pounding rice, and entirely neglecting the cane piece. I need not say that rice growing was put down, and the Timinians soon after removed to some new location.

I have gone somewhat fully into these my early recollections for two reasons. First it explains how rice may be induced on dry land to produce two crops per annum, by simply burning off rough herbage in the dry weather and sowing the seed with the first rain, say in May, in which case the crop is ready for reaping in October; and in the same way, rice planted in first rains in November would be ready for the sickle in April. The rapidity of the rice growth chokes off all other indigenous weeds; hence there is no call for expensive weedings. Secondly, it shows what in my opinion has kept back the spread of rice cultivation, viz: sugar. While sugar commanded a high price in the markets of the world, the fact of this colony having unlimited room for the extension of sugar cultivation, and having a sparse population, most of whom preferred the planters' cash on the weekly pay day, to the insecurity and time required for rice or other food products to mature, besides risk of robbery, accounted for the small attention given to Minor Industries.

At the present time, with a supply of labourers more equal to the demand, and a dying-out of all gambling in connection with sugar, and when many of the introduced

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workers from India, China, and Barbados, have been taught in the school of adversity that if they want to reap and eat, they must sow and labour, a new departure may be considered as having overtaken the colony.

The praiseworthy attempt made by Mr. COLVIN to grow rice on a large scale in Canal No 1, and by the Company which started under such favourable circumstances at Vive-la-Force, both failed from similar causes—want of practical knowledge of the land and seasons, and also want of a water supply—to which I ought to add, the stubbornness and want of belief on the part of the labourer employed in carrying out details.

The next practical test came under my own observation and encouragement about 1865, when a couple of hill coolies asked me to allow them to have 16 acres in front of Edinburgh house for rice growing. Seeing the heavy work of breaking up the land, I suggested bullocks and the plough, to which they readily agreed, and when I thought I was doing a great thing in adding a couple of Yankee eagle ploughs to the oxen, they said in their looks "Poor buckra, he no sabe." Instead of my ploughs and harness, I found them with a mangrove root shaped into an Egyptian plough with a long stick leading up to the yoke, the latter being a straight courida stick with two holes bored at such distances from each end as to admit of two pins being driven through, one on each side of the bullock's neck; these were tied under the throat with a piece of string. When the team was ready to operate—and the way those coolies managed a pair of oxen direct out of the pasture was a sight worth seeing—they disturbed and worked up the surface of the land into such a puddle as would have disgusted an

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agriculturist from the old country, and made him think the land ruined for ever. Having reduced it into this state, a plank was set on edge, and with a pole extending to and fastened to the yoke, this blunt rake was hauled backwards and forwards until the surface was as smooth as a billiard table; water was of course admitted all through these operations. On a small paddock of about 4 square roods, was sown the seed rice, much as we see cabbage-seed planted in English gardening. By the time the land was reduced to the puddle above described, these seedlings were seven to eight inches high, and the seed bed being in a state of pulp, they were easily pulled up in handfuls of a dozen to each handful. These were conveyed to their final destination, and the operator separating a single stalk plunged his hand down some four or five inches into the puddle, and by a judicious turn of the hand, left the rice shoot firmly planted in the soil, each plant being set in squares nine by nine inches or thereabout. For the first few days the plants so pulled about looked drooping and seedy, but they did not remain long in this condition, for on the plant taking to its new position it began to throw out shoots more like leeks than a simple cereal. In a month's time the women and children went through and plucked out all indigenous weeds and grasses, and tying these into small handfuls, placed them under foot and firmly imbedded them in the soft soil, there to rot and form manure for the rice crop. Water was let on from navigation canals at stated intervals, and when the water ran low, recourse was had to the basket with double strings, and the lift being next to nothing, it was astonishing how soon a couple of men could lay an acre under water.

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When the rice came into ear all the grain-eating birds flocked round the devoted patches, some of them sucking the milky fluid out of the embryo rice. The ryot was equal to the occasion, by planting a series of poles one at every 100 feet with the tops slightly bent, and a kerosine tin containing a few pebbles suspended to each pole; these were joined by an endless line to the outside of the field, and when an urchin gave a pull to the string, all the tin contents gave a sudden clatter, quite enough to dismay and frighten the most pert of the feathered tribe. While this was going on the two men betook themselves to preparing mortars and pestles and a barn anent harvest; the two span of bullocks having become so to say a part of the household, played with and caressed by the women and children.

Harvest arrived, with need of additional hands, to reap the crop while it was crisp and dry; and here came the first clash between manager and rice grower, the one wishing to keep his mill supplied, the other wanting to save his rice. I decided in favour of the rice grower, as the reaping was not likely to employ too long a time. The workers, with a small toothed reaping hook, smaller in size but much the same as the now obsolete tool formerly used for reaping in the old country, cut the head of grain off with about a foot of stalk, which being made into small sheaves after remaining in the sun for a time, were finally conveyed to the barn, a rough structure thatched with cane bands. A stake was driven into the ground at one end of the barn; by freely ramming the surrounding earth, a threshing floor was secured say about 12 feet in diameter. The bullocks were yoked close together and made to walk round this stake, while sheaf after sheaf

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was thrown under their feet and shaken up so as to bring every part under the tread of their feet. It was simply astonishing how quickly the grain was by this means separated from the straw, the paddy being from time to time swept into heaps and put into bags, for the winnowing operations. This was done in a clear space, exposed to the wind, by the well known ancient system of letting fall from a sieve. The paddy once ready for market, a ready sale for it was found on the estate.

Harvest over, water was let on, and a fine ratoon crop came up as by magic, little inferior to the first. After reaping this crop, the land was again treated in exactly the same way by puddling as at first, of course the work being much easier.

For want of labour, in 1872 the rice cultivation ended. The whole of the above description can be applied to the venture in rice cultivation which has been carried on for several seasons on Novar and Dundee, in the Abary district, by the coolie proprietors of those estates.

While I was watching the rice industry on the West Coast, the late Mr. BASCOM at Anna Regina tried a most interesting experiment among the Chinese of that estate. To gain a reservoir supply of water for his gang and machinery, he constructed that grand reservoir, one of the sights of Anna Regina; a two feet earthenware pipe was placed, conducting the water from Quackabooka which stands at a high level, under ground and through the Chinese quarters. Now, Chin Chin was not slow to grasp the situation, and, unknown to Mr. BASCOM, uncovered the pipe, drilled a hole in it, inserted a bamboo, and by that means secured a never-failing supply of water for his gardens which were then covered with

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eddoes and other vegetables. Having secured water, they set to work in true Chinese fashion, and reduced the height of the land, by digging out certain areas and raising others, making the garden ground what it remains to this day—a picture of Chinese rural scenery. The low plots produce the most magnificent rice and have continued to do so for at least 18 years without rest ; and a reason for this may be found in the following passage from DE BOW'S Review :—"The Chinese, who pay the greatest attention to the cultivation of rice, manure their land with all sorts of filth, dung, &c. They preserve all the scrapings of pig's hair, the barbers carefully preserving the human hair, which is no small quantity where the head is shaved, and the cultivators of the soil readily purchase this compost at a penny per pound, and barges are to be seen on the canals entirely laden with nothing else. The Chinese cultivators look upon hair, of whatever nature, as of extreme value in rice cultivation. It is not unusual for them to mix lime with the water of irrigation, which they consider draws off insects and gives warmth to the ground."

Those who pass to the leeward of the Chinese gardens of Anna Regina in the spring time will readily recognise that this peculiar habit of conserving manurials has not been forgotten in British Guiana. Although the Chinese thus carry out their inborn habit of allowing no matter to go to waste, I do not think the rice plant in the deep rich soil of this colony really calls for manure. We see crop after crop raised on the same land, with a tendency towards improvement rather than a falling off; and when we see the luxuriant crops grown in the bottom of canals where the soil is far under atmos-

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pheric influence, this alone shows how well our soil is adapted for rice. By the way, there is a considerable area of fine rice grown in many districts of the colony in navigable canals, when these are out of use. Some planters object, because of the tendency of the sides of a dry canal to break in, and there is reason in this objection. The canal bottoms are specially suitable for a paddy garden because of the ease of irrigation.

These Anna Regina garden lands have been held rent free, being simply the garden grounds attached to the cottages. For several years past the industry has been spreading, the waters of the Quack-a-booka, a fresh water canal, having being laid under contribution; and on the coolies applying for land on which to grow rice on a sound tenure, Mr. GILZEAN very readily acceded to their demands, and now there are over 200 acres—it will in a few months be 300—of grand paddy fields, adding quite a charm to the surrounding scenery. Before explaining the mode of dealing with Anna Regina paddy fields, I must ask you to allow me to turn for a moment to what I shall denominate "Manna Rice," or that grown in a semi-wild state on the savannahs of the East Coast. The idea of a spontaneous spread of this growth from particles let fall by labourers when working on service canals might have been entertained had these people carried paddy, instead of rice prepared for the pot, which latter is the condition in which all rice is used as food, and is no longer in a condition to germinate. The fact is, small patches of rice have been grown on spots since the East Coast water scheme brought the savannahs into notice; and the fires of '82, '83, and, '84 having cleared off all the rough herbage, ferns, &c., &c., the state of the land

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naturally invited the rice growers to extend their operations, which they did to some effect.

The land behind the La Bonne Intention is very favourable for this wild system of cultivation, as the canal which I dug to gain water has a trunk or syphon underneath the main service canal by which the water behind that section of coast can be regulated. The water connection being continuous, by the navigable canals direct to the sea, to relieve the rice growers' lands throws no additional strain on the drainage of the estate, but rather does good, by keeping the channel open. In this way, every dry season, the water can be lowered to allow of harvesting and burning off the rough surface preparatory for another sowing. In the figures supplied by Mr. IMLACH it must be clearly understood that they relate to semi-wild cultivation, as follows :—

A bag of rice for seed will plant about 4 acres, and costs ...	$	2 40
Weeding and burning		8 00
Planting 1 day, 1 man...		24
Reaping, 4 strong men, 6 days at 52c.		12 48
Threshing and cleaning		96
	$	24 08
Gives in a good season 30 bags rice at $2 40		72 00
or $12 00 per acre, in 6 months, profit	$	47 92
If they clean this rice it will give 15 bags and will cost :		
Growing	$	23 12
Cleaning		19 32
		42 32
15 bags cleaned at 32 cents per gallon, equal to $6 40 per bag, White Rice		96 00
Profit	$	53 68

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The cost for scaring birds in the savannah is nil, the only birds to be seen are a species of wader resembling at a distance "Negro Cop," and they are now harmless.

In putting a price on rice grown on the East Coast, the local selling value for paddy was given; the cleaned rice is white, such as you see on the table, which is sold retail at 36 cents per gallon. I may mention that the command of water to let off and on at pleasure is of vital importance, when attempting to grow anything in such pegass land, which burns up in dry weather to a cinder.

Turning now to Anna Regina, as the most perfect mode of cultivating rice, entirely by spade and hoe, that I have seen or read of, the arrangement is as follows:— As to the land, the abandoned cane fields, by preference in the lowest lying section of the properties, find most favour, as being the more readily put under water from the navigable canal. The arrangement is eight months rent free; at the expiration of that term $23 04 annually is paid in monthly instalments. An arrangement which refers more to the question of immigration is also entered into by which three days per week labour when called upon counts half rental, but for the object of this paper I confine myself to the ordinary tenants' agreement of $23 04 per annum, of course, including water.

The rice farmer, having signed his agreement, enters upon possession, and when land carries sage, waak-a-baki, and such like, it is preferred, as the land is in better heart than where simple nut and bahama grass forms a complete sod. The bush is now all chopped down with

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cutlass, and the cuttings when dry are partly carried away for fuel to cook food and the remainder is burned where it lies.

The beds are what are known as round ridged, the small drain in many cases forming a hollow 6 feet at surface, 2 feet at bottom and 4 feet deep. The workman begins by reversing the order of cane culture, and delves the entire surface with all its noxious grasses a foot deep, and buries all in the drains which cost the sugar planters so much to dig. This work at once gets rid of all grass, and the hoe is set to work to chop the ground quite fine to a depth of 4 to 5 inches ; water is now let on, and the whole made into a puddle exactly as I have already described at Edinburgh ; in fact, the after treatment is exactly the same, and in every way resembles the best system carried out in South Carolina.

The Anna Regina paddy farmers seldom grow a ratoon crop, being satisfied to reap 3 full crops in the year after the preparation and planting. In the eight months allowed rent free first year, they establish and reap one crop, and have another well established, which covers preliminary heavy work in levelling down, &c., &c.

Mr. MCPHAIL, to whom I am indebted for the following figures, writes as follows:—"The first year when the beds have to be levelled, this process alone costing $16 and $20, they only secure one full crop, though the second is well established. It is fair to take up the working expenses at this stage, and I may add that the farmers who have prepared the land best are the most willing to pay rent punctually. The land with stubble is burnt off and hoed up, and converted into a proper puddle for receiving the rice plants, which are grown in a nursery.

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Such a nursery can be prepared for 82 cents. Nine strong women or very ordinary lads can dibble one acre in a day, and the same number can reap the grain with ordinary grass knives. The birds are kept off by scarecrows, and children knock a tin pan, for which an allowance of $1 20 per acre may be allowed; weeding and burying the grass and other stray plants, $1 50 per acre; heading, carrying to barn, threshing and dressing for market, including sack, 15 cents per bag. Thus summing up 1 acre 1 crop:—

½ Bag rice, preparing nursery...	$ 0 82
Cutting and burning stubble	2 00
Hoeing up the seed bed	2 00
Dibbling from nursery, 9 women 24 cents	2 16
Weeding young crop	1 25
Driving birds &c....	1 47
Reaping, men at 24 cents	1 90
Heading to barn, threshing, dressing and bags, 20 boys at 15 cents	3 00
Cost on crop	$ 14 60
3 crops, one year's expenses	$ 43 80
Rent	23 04
Total cost per acre	$ 66 84
By 3 crops, at 20 bags each, 60 at $2	$120 00
Clear gain	$ 53 16

This leaves a fair margin of profit for the labour expended and I feel well within the mark in all my prices.

I think these figures show that I was warranted in stating that "given water, rice can be grown in British Guiana to drive out the imported article." I have carefully studied the question of rice growing as far as I

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can find it laid down in books, and while 2 crops in a year is considered a wonderful yield in China, Japan, India, America and elsewhere, here we have well authenticated records of 3 crops in the year, and if ratoon crops were taken into account it would raise the return to 5 crops. Twenty-three dollars rent per annum is out of all proportion to the selling value of land. Multiply that sum by 75,000 acres in cane cultivation, $1,728,000? If the land owners could realize half that sum by their canefields, there would be no cry of hard times.

Turning to improvements in threshing and dressing grain, my friend Mr. CORNISH has suggested certain minor appliances to deal with the rice in small quantities for local consumption which I have sent for. There have been no end of patents for cleaning rice, but all seem to fail. I have myself introduced one machine by WILSON of London which played such havoc with the rice that it had to be given up. The late Mr. OLIVER introduced a card machine shod with bent steel wire fixed into a band, which ran at a high velocity against a plain roller; but this also failed. So I am afraid there is no high road to rice cleaning. It must just be subjected to mill stones for breaking the rough crust and then to stamps, such as are in use in large rice cleaning factories in Europe; where by the way, all rice is received from the East in the paddy state, as the husk prevents destruction by weevils.

The following description of rice preparation is from DE BOW'S Review, and embraces the most complete treatment of the subject that I have come across :—

Process of Preparation.—The stones which are used for grinding rice should be five to six feet two inches diameter, and eighteen inches thick at the centre.

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"The whole process of preparation may be described as follows: From a shed attached to the mill house the rough rice is taken by means of elevators up to the highest apartment in the building, to be passed through a sand screen revolving nearly horizontally, which in sifting out the grit and small grain rice, separates also all foreign bodies and such heads of rice as were not duly threshed.

"From the sand screen the sifted rough of large size is conveyed directly to the stones on the same floor, where the husk is broken and ground off, thence to a wind-fan below, where the chaff is separated and blown off. The grain is now deposited in a long tin placed over the pestle shaft, and corresponding in length with it, whence the ground rice is delivered by wooden conductors into the mortars on the ground floor. These mortars are constructed of four pieces of the heart of pine seasoned. They are in figure a little more than a semi-ellipsoid and are made to contain four and a half bushels of ground rice each.

"The pestles, also constructed of the heart of pine and corresponding in number and position with the mortars, are sheathed at foot with sheet iron, partially perforated from within by some blunt instrument, so as to resemble the rough surface of a grater. They are intended to weigh each 240 to 280lbs. or thereabout, are lifted by levers six feet long attached to the large pestle shaft, and make about forty-five strokes in a minute. A mortar of rice is sufficiently pounded in one hour and forty minutes to two hours. The grain thus pounded is again elevated to the upper floor to be passed through a long horizontal rolling screen slightly depressed at one end, where by a system of grading wire-sieves, becoming coarser and coarser towards the lower end, are separated first the flour, second the small rice, third the middling rice, fourth and last the prime rice which falls through the largest web, and forthwith descends to the polishing or brushing screen below, whence it descends through a fan into the barrel on the first floor, where it is packed, and the preparation is completed. The head rice or largest grains of all, together with rough unbroken by the stones, passes off at the lower end of the screen to be pounded over.

"The brushing screen consists of a vertical cylinder or drum, two feet in diameter, by from four and a half to six feet in height, to the surface of which are attached, vertically, shreds of sheepskin closely packed; this drum is made to revolve with great velocity within and lightly brushing a cylindrical frame of iron wire made into a fine sieve In passing down spirally between this clothed drum and the exterio,

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cylindrical wire sieve, the grains are relieved of the particles of flour, which still adhere to them, and which are brushed off by the wool and forced out through the meshes of the wire. The rice thus brushed clean and polished against the wire is packed into barrels constructed of pine staves to contain six cwt. net. The middling and small rice is passed through a fan which blows off from the flour into an apartment kept for that purpose."

In this colony the Chinese have introduced a sort of "quern" with stones, where such can be found; and when not they make a circular casting in clay similar in appearance to a centrifrugal machine, letting in pieces of hardwood in such a way that when the centre revolves, rice falls between the outer casing and revolving centre, and the husk is partially broken. Then it is winnowed; the clean rice separated, and grain with husk only cracked is transferred to mortar and pestle, which is an ordinary foo-foo mortar sunk in the ground acted upon by a shod pestle with ferule projecting a little below the wood. The pestle is fixed into a solid beam and this is again fixed on a pivot with the determination of weight towards the mortar. A man or woman at the far end of this lever by means of the foot depresses that end, when the other end rises in like proportion and is then allowed to drop with force upon the rice. Another winnowing, and the rice is ready for market. When brown rice is the aim, the paddy is scalded with boiling water. This swells the grain, and in drying the skin cracks and leaves the kernel much easier to clean than when white rice is the aim. Of course the oil stains the grain, hence brown colour.

In a paper of this nature, treating of such an important agricultural product, it is proper that some allusion should be made to the area of land available for prose-

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cuting the industry. I might spread my hands along the entire delta, from Corentyn to Barima, and say, wherever water can be stored against drought for purposes of irrigation, there rice can be grown to advantage.

The lower Essequibo coast may be now looked upon as the centre of the industry. Coming further up to that grand well-watered district embraced by the Itooribiscie and Supenaam Creeks, rice growing has already taken hold; but the want of water in times of drought causes it to languish. Place barrages across those two creeks, and cause the water to spread along the face of the district as now so well accomplished on the Boerasirie on the West Coast, and the Lama and its tributaries on the East Coast, and the finest rice fields in the world would be opened up. Huist-te-Dieren was selected for a coolie settlement, simply because of its proximity to the Itooribiscie, and the natural formation of the land along the whole of that estate, and that district, which is laid off in terraces by ancient tidal action, affording swamps suitable for rice cultivation, alternately with bands of high loamy land fit for the growth of vegetables calling for drained soil.

The districts embraced by Mahaicony and Abary Creeks are exactly the same; and allusion has already been made to the praiseworthy start made by the East Indian proprietors of Novar and Dundee.

The Canje Creek has long been noted for the superior quality of rice grown on its banks high up country. Within the last few years, the abandoned estate *Prospect* has been taken up by Indian rice growers, and considering the meagre supply of water at their command, they have done wonders, and now with a supply of fresh

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water from beyond the salt-water compartment of the creek, the whole of the abandoned estates on the right bank will be fit for rice.

From the valuable reports which are furnished to the Agricultural Bureau of the United States by their consular agents from all parts of the world, I cannot forbear transmitting the concise report of the Honorable HORACE CAPRON, written in 1873 on rice culture in Japan, as it is so analogous in many respects to what one finds in the rice gardens of this colony, especially those belonging to the Chinese. I have not been to Hopetown, Camoonie Creek, for years now ; but when last there the surface of the land and work done was exactly as described as prevailing in Japan.

The concluding paragraph of this report is so to the point that I copy it. There is nothing in all the agriculture of our country that can compare with Japan. The *grand secret* is, drainage, irrigation, economy and use of fertilizers, and thorough tillage :—

" Rice is the staple crop of Japan. In the present state of the census reports it is impossible to give the exact acreage of rice. The report of 1870 places the number of acres at 8,000,000. Whether the area devoted to cultivation is increasing or not, it is impossible to tell. The production has been controlled entirely in the past by the home demand. Now, that the Imperial edict forbidding its export has been repealed, the production will be stimulated by the world's demand.

" The last 'Red Book' of the Tycoon gives the total income of the Daimios, which was always paid in rice, at 6,000,000,000 pounds, or 111,000,000 bushels. This did not include the income of the Mikado's court at Kieto, for the support of which the income of the five richest provinces of the Empire was set apart. Thus the rice product was able to pay a tax of from seven to eight billions annually. Ninety-five per cent. of the rice of Japan is low-land rice ; almost the whole of the valley land is devoted to rice growing. It is the richest soil, and is the best adapted to irrigation. The land is divided into small lots,

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scarcely ever more than an acre in one lot, and often less than one quarter that amount, and banked. This is thoroughly levelled, so as to be entirely flooded. All the soil removed in levelling is put on a lesser space adjoining, which is planted in vegetables. The rice-ground is thoroughly flooded over several times, on different days, in April, after which it is dug up with a heavy hoe. This hoe or spud is unlike any civilized implement. The blade is about 16 inches long and 4 inches wide, and will weigh from 6 to 8 pounds. The handle is 5 feet long. With a powerful blow it is sunk the full length of the blade into the soft soil, and with the long leverage of the handle a large amount of earth is lifted up and turned over. This process is slow, but it leaves the soil in a much better condition than can any plow. At 12½ cents as the whole cost of a day's labour, it does not cost much more to dig up an acre of *tilled land* to this depth than it does to plow an acre with us. In May, the seed-rice—about one and a half bushels, is put upon an acre—is first sown upon a small piece of ground. The 5th day of June is the national thanksgiving (transplanting) day when these thickly sown stalks are pulled up and transplanted in the rice paddy, where it is grown, the soil having been prepared by thorough flooding, till it is completely saturated. After the transplanting it is again flooded, and while in this condition 800 pounds of rape seed oil cake, or sardine oil cake thoroughly pulverized, and costing $8 to $12, is sown to the acre. The water is then turned off, leaving this soaked fertilizer at the root of the rice stalks. After frequent flooding during the summer, it is harvested in October. It is cut with a sickle something like a corn-knife, bound in bundles, and carried to high grounds, dried, and threshed at leisure, or rather shelled by drawing the heads of a small handful through a crude heckle. The cleaning or winnowing is done by pouring the rice from a basket or bucket upon mats by one person, while another fans it with a large paper fan.

All this work of cutting, binding, shelling, and cleaning is done by women, who, while cutting and binding, stand bare-legged in the water 10 to 12 inches deep. The rice is then put into small straw bags, about 130 lbs in each, and sent to the mills on the backs of men or horses, where it is hulled by water-power, or by the primitive mortar and pestle worked by the feet. From the interior, horses are used to carry the rice, 300 pounds being the average load to a horse. A good horse, with a man to lead him, will earn 50 cents a day, out of which the man is fed and the horse fed and shod.

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The average yield is 50 bushels to the acre, and the average weight of lowland rice is 55½ pounds to the bushel, making 2,666⅔ pounds to the acre. It requires 80 days' labour to each acre from the first flooding till the rice is marketed.

The result per acre of rice-raising can be stated as follows :—Labour; $18; manure, $8; interest on $100 @ 10 per cent., $10; total cost, $36; 2,666⅔ pounds of rice at 2½ cents, $66 66⅔; total profit, $30·66⅔.

If the above was a real profit, the farmer could make a favourable showing; but the Government tax is claimed by the farmers to be 50 per cent. of this profit, leaving only $17 to $18 per acre.

As I remarked before, 10 acres is a large amount for one proprietor, and many have one acre or less. The upland rice is sown at the same time, and flooded and manured in the same manner; but the yield is far less and the profits proportionately small. The lowlands rest during the winter, but the uplands are immediately dug up and fertilized with rice, bran, or hulls, or horse-manure, rice-straw, or liquid manure from water closets, at a cost of about $4. to the acre and sown in wheat or barley.

I trust that in this paper I have brought together trustworthy information to guide those who may throw their energies into rice. All the work required is of so light a nature that women and children may find employment at it; and I see no reason why bullocks may not be pressed into the service in the rougher manipulation of the land. In all my remarks, I allude to small cultivators, there being no restriction to the size of the plots; it may be a square rood, or an acre, or a company with a thousand acres.

I take this opportunity of thanking all the gentlemen who have assisted me with reliable information connected with the subject under consideration, especially Mr. IMLACH of La Bonne Intention and Mr. MCPHAIL of Anna Regina.

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Occasional Notes.

Sir R. Schomburgk on the Æta Palm.—The following is an extract from a report of a meeting of the British Association held at Cambridge, commencing on the 18th of June, 1845, which appeared in the "Gardener's Chronicle" for the 5th of July 1845, p. 458.

"Sir ROBERT SCHOMBURGK then read *a Description of the Murichi or Ita Palm of Guiana,* of which the following is an abstract:—

"The author referred to the early accounts which naturalists in Europe received of this beautiful Palm, of which Sir Walter Raleigh appears to have brought the first fruits to Europe. Clusius, in his "Exotic Flora" describes it as *fructus elegantissimus squamosus similis palmæ-pini*; and Father Gumilla, Gili, and the elder authors on Guiana, extol it in consequence of the various uses the aborigines of Guiana make of it. It serves at different stages of its growth as a vegetable, and furnishes a cabbage equal to the *Palmetto*; at the maturity of its fruits, they are eaten, as well in their natural state as prepared into a drink, which, when drunk copiously proves inebriating. It is remarkable that when much use is made of the fruit it communicates to the linen a yellow colour after perspiration. The trunk is tapped and a fluid flows from it which possesses much saccharine matter. Of the greatest delicacy is however the saccharine liquor extracted from the unexpanded flower, which affords a liquor resembling champagne in its briskness. The Indians prepare from the pith of its trunk a flour resembling that of *Sagus farinifera*, which the Warrow Indians call Arú*; mixed as a pap it is considered to be an excellent remedy for dysentery. The fan-shaped leaves are used as a thatch for covering their houses, and the stump of one of these leaves serves as a broom to sweep it with. The Indians of the savannahs and mountainous tracts use the base of the half-sheathing leaves for making sandals. The

* The flour which they procure from the arrowroot is called Arù-Arù and our denomination, arrowroot, is most likely derived from the Indian word.

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mid-ribs of the young branches are cut in thin slices, and after having been dried they are connected together with withes and bast, and serve as a sail for the Indian's canoe, or as a mat to sleep upon. They are used by the travelling entomologist as a substitute for cork to fix insects upon, or by those who are provided with strong beards, as razor straps. Of the greatest use are, however, the fibres of the young leaves, which are manufactured into thread and ropes, and they are of such a tenacity that the greater number of Indian tribes fabricate their beds and hammocks from it. The inhabitants of the Rio Negro make a trade of it, and a fine hammock is sold from 10 to 12 Milreis. Even in its decay the Murichi is of use, and affords a delicacy to the Indians, which likewise many colonists do not refuse, mamely, the larvæ of a large beetle; the Curculio palmarum is found in large numbers in the pith when the trunk is near its decay, and which, when boiled or roasted, resemble in taste beef-marrow. This useful tree, which extends from the Llanos of Cumana to the western tributaries of the Rio Negro, and the mouth of the Amazon, or over an area of 550,000 square miles, was appropriately called by father Gamilla, arbol de la vida, the tree of life; and it is related at the Orinoco, that one of the kings of Spain, hearing of this wondrous tree, which at once furnished bed, bread, and wine, attempted its introduction into the mother country. The author wished to correct finally those who have written on this tree, in two points. It is firstly described as a tree scarcely 30 feet high, while it reaches sometimes a height of 120 feet, and its average size in Guiana is not less than 50 feet; and next it is asserted that they are not to be found at a greater height than 800 feet, while the author has met them in numerous groups, and of a luxuriant growth, at a height of from 3,000 to 4,000 feet above the sea; but strictly to its nature it grows likewise here in groups and in swampy soil."

Guiana Orchids.—During the past year the "Gardener's Chronicle" has contained various notes on orchids from our colony. One of the most important additions made for some years to the orchid-houses of Europe is the magnificent *Cattleya Lawrenceana*, *Rchb.f.*, procured by M. SEIDEL from the base of Roraima, contemporaneously with my visit to, and ascent of, that mountain.

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Various notes on this plant have already been published in *Timehri*. To these may now be added the following. In its first number for the year 1886 the "Gardener's Chronicle," reviewing the new introductions of the past year, declares that—

Cattleya Lawrenceana is quite a phenomenal introduction, on which all eyes are turned to see how it will answer those descriptions given from the living plants and dried flowers, good illustrations of both of which will be found in the *Gardener's Chronicle*, pp. 374, 375, vol. xxiii, and of its interesting home in the Roraima district at p. 160, vol. xxiv. There is no fear of disappointment in the matter, for the plant is one of the most distinct, and the freest grower we have, and the old flower-spikes exhibit six to twelve flowers on each of many of them. The flowers, which will, no doubt, exhibit endless variety, are generally of a clear purplish-lilac, lip dark purple, yellow in the upper part. Soon the mystery will be solved, for it is in sheath and bud everywhere. It is one of Messrs. F. Sander & Co.'s most promising introductions.

Soon after this was written, the plants at home began to flower for the first time.

What a pleasure, writes Professor Reichenbach, the great orchid specialist, of our Cattleya, to see Sir Trevor Lawrence's blooming beauty fresh at hand. It was kindly sent me on March 10 by Messrs. John Laing & Co., Forest Hill, S.E., London—two magnificent flowers. The general tint is that of *Cattleya superba*, and thus the flowers are what I had expected them to be, promising, no doubt, some improvement in longer established plants. I have, however, to add two odd peculiarities, unnoticed in the fine dried flowers. The tube of the lip is incurved. The small column is not straight, but also incurved, with abrupt broad wings on each side. No doubt a great display of such fine flowers may be expected.

A little later in the year a beautiful example of this same Cattleya was shown at a meeting of the Horticultural Society by Mr. BALLANTINE, gardener to Baron SCHRODER, of The Dell, Egham. It was, perhaps, the finest plant of the species seen at any exhibition, and was

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in perfect health. The plant bore fifteen of its bright reddish-purple blooms.

Then, as had been expected, among the many plants imported of this orchid, some fine individual varieties began to appear. Of one of these, REICHENBACH writes :—

CATTLEYA LAWRENCEANA *(Rchb. f.)* CONCOLOR, *n. var.*

Once more a most agreeable surprise from Mr. F. A. Philbrick, of Oldfield, Bickley Park. It is an exceedingly fine thing, a Sanderian importation, having the flower of one whole shade of fine light purple. The anterior part of the lip is not dark purple, it has the same colour as all the other parts. Thus Mr. Philbrick states rightly it makes one think of a *Cattleya Skinneri* with no dark colour at the end of the lip. It is said to be very attractive by candle-light. I really think it is quite an acquisition. May it appear at more places.

So far, I have been reporting the verdicts given in England. In the colony, too, the plant flowered about the same time,—at the Botanical Gardens among other places. In this latter place Mr. JENMAN'S first verdict was somewhat disappointing, and somewhat surprising to me. He wrote somewhat disparagingly of the plant in the "Argosy." On account of the sea-breezes there prevalent, the Botanical Gardens are not favourable to orchids. Moreover due weight had to be given to the fact that the orchid was then flowering for the first time after it had been torn from its native home and roughly transported on men's backs for some weeks across a sun-scorched savannah land. Here in the Pomeroon river, where my own plants flowered about the same time, and where they were seen by Mr. JENMAN after he wrote his "Argosy" note, the circumstances are much more favourable; and here, as was therefore to be expected, the bloom was much more abundant and much

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finer. But I can assure orchid growers at home and also Mr. JENMAN, that no one except the few of us who have been lucky enough to see the plant in its native home, has yet had an opportunity, in any way satisfactory or sufficient, of judging of the splendid qualities of this plant.

To turn to another orchid, the following note refers to a variety of a fine old orchid, which is perhaps the commonest of its family in Georgetown gardens :—

ONCIDIUM LANCEANUM VAR. SUPERBUM.

This variety, which differs from the type principally in the richer colour of the flowers, is figured in a recent number of the *Lindenia*, t. xvi. It is a native of Dutch Guiana, and requires a hot temperature, with full exposure to light, and an ample supply of moisture during the growing period.

The following two notes refer to an orchid collected on Roraima by Dr. SCHOMBURGK and by myself, and collected also at the Kaieteur by Mr. JENMAN. The original Roraima plant was described as *Cypripedium Lindleyanum* by SCHOMBURGK. The Kaieteur plant was at first regarded as a distinct species, and described by Mr. N. E. BROWN of Kew, as *Selenipedium Kaieteurum, N. E. Br., n. sp.* :—

Leaves 7—9 inches long, 2—2½ inches broad, lanceolate-oblong, acute, glabrous, very coriaceous, bright dark green above, paler beneath. Scape many-flowered, pubescent, with complicate, acuminate, glabrous sheaths and bracts, of an olive-green, with brownish-red nerves, and suffused with the same colour. Ovary 2½ inches long. Dorsal sepal 18—20 lines long, 9 lines broad, oblong, hooded at the apex, margins recurving, crisped-undulate ; lower sepal 15—16 lines long, 1 inch broad, elliptic, entire, or slightly bifid at the apex, concave, margins crisped-undulate ; both sepals are pale green, with reddish-brown nerves on the outside ; they are pubescent on both surfaces, but more minutely within. Petals 2½ inches long, 6—7 lines broad, falcately linear-oblong, apex very obtuse and emarginate, margins recurved, undulate and

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ciliate, the cilia towards the apex becoming longer, and dark purple-brown; inside and out of the petals are pale green, prettily marked with brownish-crimson veins; on the outside towards the margins and apex, and on the inside at the base, and along the lower margin, they are pubescent. Labellum 1½ inch long, ¾ inch broad, with the inflexed sides very obtusely rounded, glabrous, bright light olive-green, with brownish-crimson veins, and densely dotted on the inflexed sides, and more sparsely on the front part of the lip, with the same colour: staminode somewhat squarely trapezoid, pubescent, greenish-white.

Although the leaves are not variegated, and the flowers are not brilliantly coloured, yet on the whole the plant is rather a pleasing one, and many orchid lovers would consider it a great prize. The plant was sent to Kew by Mr. G. S. Jenman, who discovered it growing abundantly on the rocks, under the magnificent Kaieteur Fall, on the Potaro River, British Guiana, where it is not very likely to be disturbed by collectors for some time to come; it is No. 879 of Mr. Jenman's dried specimens. Specifically it is allied to S. Lindleyana, but differs in having more glabrous sheaths and bracts, and differently coloured flowers.—*N. E. Brown.*

A plant from the Roraima locality, collected in 1881 by Mr. BURKE, for Mr. HARRY VEITCH, was, however, submitted to Professor REICHENBACH f. who wrote then *Cypripedium Lindleyanum, Schomburgk*:—

This flowered in February, 1886, with Messrs. J. Veitch & Sons. It has greenish bracts, brown ovaries, pallid greenish-sulphur-coloured sepals and petals, and lip with red veins, and similar veins and spots on the lip. The staminode is tridentate, the side-teeth divaricate, yellowish-green, with red hairs. The petals of Messrs. J. Veitch & Sons' plants are unusually narrow and long, and very wavy.

Having been asked by various correspondents for my opinion about Selenipedium kaieteurum of Mr. N. E. Brown *(Gardener's Chronicle*, 1885, August 29, p. 262), I addressed myself to the authorities at Kew, and was kindly furnished with a wild grown flower and a fresh leaf. Originally I was very partial to the thing, the more as Messrs. Veitch's narrow-petalled plant looked very distinct from the wild grown kaieturum. The author said:—"Specifically it is allied to S. Lindleyanum, but differs in having more glabrous sheaths and bracts, and differently coloured flowers." I thought I might find a difference in the shape of

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the shoe. I preferred, however, to defer the formation of an opinion till my most recent rich materials should be available for inspection after having been set aside for poisoning. Finally there are before me, four inflorescences. I am persuaded Mr. N. E. Brown, after their inspection, would combine both together; at least, I do not see any difference. The representation made by Sir R. Schomburgk's artist, both kept at the British Museum in the original, and at Kew in a copy, may have influenced Mr. N. E. Brown. I do not think it a masterpiece of accuracy, as indeed could not be expected from a young artist working during such an uncomfortable journey. *H. G. Rchb. f.*

The "Mosquito Worm."—The following passage in a letter received from the well-known Entomologist, Miss ELEANOR A. ORMEROD, refers to a painful subject on which further information is much required, and may possibly be given by some of the readers of *Timehri*. I may explain that I can answer personally the question as to how it feels to have a mosquito-worm in the flesh. The pain is not continuous, but is as though occasionally, and at quite uncertain intervals, a bunch of small fish-hooks embedded in one's flesh were twisted suddenly and sharply round. I can also, fortunately, tell from experience that a remedy is very simple. Externally the part of the flesh in which the mosquito-worm is embedded looks like a small boil or tumour in the head of which a minute hole, presumably a breathing-hole for the creature, may be detected by a careful observer. If a small piece of ordinary sticking plaster be pressed firmly over this hole, the creature is choked; and in the course of a few hours if the plaster is pulled off the worm will come with it. This very simple operation is really beautiful because of its complete efficacy and

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neatness, the worm coming out as neatly as a hand may be withdrawn from a glove.

Do you take an interest in the inquiry caused by the larva of the Œstrus—the *Hypoderma bovis* more especially? We are taking it well up in England, and I hope that much will be done to check it. The observations lately sent in shew that just a dab of what is known as "Cart Grease" is enough to choke the spiracles effectually and thus kill the maggot. But with regard to kinds attacking "ourselves" Humboldt recorded that in Brazil the natives (unencumbered with the protections we use!) suffered from larvæ in their backs. It would be of some interest to us here to know *how it felt* to have a great maggot an inch long, or a dozen or two, feeding in one's back, that if you should have any acquaintance with the subject it would be most acceptable if you were disposed to tell us anything about it.

The Campbell Memorial.—While I was in London, Mr. G. LAWSON, the sculptor who has undertaken to execute the bust of the late WILLIAM HUNTER CAMPBELL, was good enough to show me the clay model, on which he is now working. The bust is already far advanced, and, considering that the sculptor never saw his subject alive, the likeness is admirable. It is greatly to be hoped that the marble will soon be finished and placed in the Rooms of our Society, for which Mr. CAMPBELL did so very much.

Balata.—In a paper on "Proteid Substances in Latex," by J. R. GREEN, B.Sc., B.A., published in the Proceedings of the Royal Society, No. 242, occurs the following passage :—

A little later in the year Mr. Dyer kindly sent me a bottle of the latex of *Mimusops globosa*, Gærtn (*Sapotaceæ*).* This differed very

* [The well-known source of the Gum Balata of British Guiana, from which the specimen was obtained. The specimens were kindly procured by Mr. G. S. Jenman, Superintendent of the Botanic Garden, British Guiana.—W.T.T.D.]

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much from that of the East Indian latex-yielding trees, being a thick, almost pasty, liquid of white appearance and sour smell. It would not filter clear through paper and was therefore submitted to the action of the filter-pump used before. The diluted filtrate, and a watery extract of the dried residue, were taken for examination.

The solution thus obtained proved on investigation to contain two proteid bodies, which could be separated from each other with tolerable ease. On heating the solution gradually, having first neutralised, a little opalescence appeared, but it did not become particulate even at the boiling point. When the liquid was made either acid or alkaline however, it behaved differently. In a nitric acid solution an opalescence was noticeable when the temperature had risen to 85—90° C. This was not removed by the addition of more nitric acid. On keeping the vessel for some time at this temperature, the opalescence became a precipitate, which was soluble at ordinary temperatures in alkalis, slightly so in water, but not in nitric acid. The solutions gave the xanthoproteic reaction. A curious point about this body was the slowness with which the precipitate formed, it appearing not at all like the usual conversion into coagulated proteid on a rise of temperature, but more like a slow precipitation by the reagent at that particular point. This was confirmed by several experiments, one of which, often repeated, was the following. A quantity of the extract was made acid with nitric acid and warmed to 75° C., a point considerably below that at which the precipitate was first observed to form. It was then allowed to cool, and as the temperature was gradually falling, the precipitate slowly separated out. The body seemed then to be slowly precipitated by nitric acid, but not at the ordinary temperature.

In an alkaline solution its behaviour was somewhat different. The opalescence set in at 79° C., and a bulky precipitate settled out slowly at 85°C. This was soluble to a large extent in nitric acid, and was reprecipitated when the liquid was made alkaline. A solution in caustic soda of the precipitate caused by nitric acid at 85° C. behaved similarly. The precipitation here also seemed to be caused by the reagent and not by the temperature, for the alkaline liquid deposited the proteid body on cooling just as the acid one did, and in about the same time as when the temperature was kept constant at 85° C. Both precipitates were unaltered in the separation; each went into solution readily in its appropriate medium, the solutions all giving the xanthoproteic reaction.

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This proteid gave no precipitate with acetic acid and potassic ferrocyanide.

After removal of this body by repeated boiling and filtration, the clear fluid gave a good xanthoproteic reaction. On applying some of the tests used in the case of the East Indian latex, the same peptone-like body was found to be present. It dialysed readily, and the solution in water gave a precipitate on saturation with solid $MgSO_4$.

Hence it appears that the latex of *Mimusops globosa* contains two proteids, one a member of the albumose group, precipitated under certain conditions by nitric acid or by potash, but not by boiling, and the other more nearly related to the peptones.

An unexpected Source of Cane Sugar.—The following extract from "Nature" should be of interest:—

Attention has been publicly drawn of late to "Mahwa Flowers"—the corollas of *Bassia latifolia*—as a cheap source of cane-sugar. This species of Bassia is a tree attaining to a height of 40 to 60 feet, and common in many parts of India, especially in Central Hindustan. It has oblong leaves of firm texture, from 5 to 6 inches long; these fall in February, March, or April, and are succeeded in March or April by the flowers. These last for two or three weeks and then begin to fall. The falls take place at night, and continue sometimes for a fortnight. The fruits, which resemble a small apple, ripen in three months; the seeds, one to four in number, yield an edible oil by pressure. It should be added that the trees are self-sown, and that they flourish in very poor and stony soil.

When the Mahwa tree is in bud, the ground beneath it is cleared of weeds, sometimes by burning. A single tree may yield as much as six to eight maunds* of flowers; even thirty maunds have been asserted to have been collected from one tree. These flowers have a luscious but peculiar taste when fresh; when dry they resemble in flavour inferior figs. They form a very important addition to the food of the poorer classes in those districts where the tree abounds, particularly in the neighbourhood of woodlands and jungles. They are specially useful in economising cereals in seasons of famine and drought. They are

* A Bengal maund equal 82¼ lbs. avoirdupois.

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sometimes eaten fresh, but more commonly sun-dried, and are usually consumed with rice and the lesser millets, or with seeds of various kinds, and leaves. It is said that a man, his wife, and three children may be supported for one month on two maunds of Mahwa flowers. *

It is not, however, as a direct article of food, nor as a material for the preparation of a rough spirit by fermentation (a very common use of these flowers) that Mahwa blossoms are now recommended. It has been affirmed that they may be employed as an abundant and very cheap source of cane-sugar. In the *Morning Post* of October 15, 1885, appeared an article on this subject, in which it was stated that, "If the Mahwa flowers be available in sufficient quantities for the sugar-makers of Europe, there can be no question that the days of the beetroot are over, and sugar-cane will go the way of all discarded products." This prediction depends, however, upon another condition besides that of the abundance of the flowers. If the sugar they contain be wholly or chiefly cane-sugar, that is "sucrose," then the argument is not without weight. But the nature of the saccharine matter of the Mahwa does not appear to have been ascertained. MM. Riche and Rémont (*Journ. de Pharm. et Chimie*, 1880, p. 215) stated that the air-dried flowers contain 60 per cent. of fermentable sugar, of which about one-seventh is crystallisable. The material available for analysis in Europe consists, of course, of the dried flowers. These may have suffered some change beyond the mere loss of water, but the evidence they afford on chemical examination is not favourable to the view that they are likely to compete with sugar-beet or sugar-cane as a source of cane-sugar. Here is the result of an analysis of a sample of Mahwa flowers (from the Kew Museum) in their air-dried condition :—

	In 100 parts.
Cane-sugar	3·2
Invert-sugar	52·6
Other matters soluble in water	7·2
Cellulose	2·4
Albuminoids	2.2
Ash	4·8
Water lost at 100° C	1·50
Undetermined	1·26

* For an interesting account of the Mahwa tree and its products, see a paper by E. Lockwood in the *Journal* of the Linnean Society ("Botany") vol. xvii. p.p. 87-90.

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The flowers analysed had a slight smell of fermented saccharine matter and a distinct acid reaction. But is not at all probable that they could have contained any large proportion of cane-sugar even when quite fresh, and that 15/16ths of that sugar had been inverted during the process of desiccation. We cannot argue from analogy in this case. For while the nectar of many flowers contains no sugar except sucrose, invert-sugar occurs in some blossoms, as well as in many other parts of plants. Even the unripe and growing stems of the sugar-cane and of many grasses contain much invert-sugar. It must, however, on the other hand, be remembered that cut sugar-canes imported into this country contain a large amount of invert-sugar, and that if they be kept a week only after the harvest, the invert-sugar naturally present in the juice shows a marked increase and the cane-sugar a corresponding diminution. On the whole, then, so far as the materials at my disposal enable me to judge, I believe that the saccharine matter of fresh Mahwa flowers will be found to consist mainly of dextrose and levulose, and that consequently they will not be available as a material for the economic production of sucrose.

I have to thank Mr. W. T. Thiselton Dyer, C.M.G., Director of the Royal Gardens, Kew, for drawing my attention to this subject, and for a supply of the material on which I have worked.—A. H. CHURCH.

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Report of the Meetings of the Society.

Report of the Meeting held 12th January.—Mr. Russell in the chair.

There were 10 members present.

Elections.—*Members:* A. P. Bugle; E. Morgan; Rev. H. A. Westropp.

Associates: William A. King; John Houston; Herbert Rolleston; James Slater.

Ridgeway & Co.—The Secretary read an extract from a letter dated 16th December, 1885, received from Mr. Walker, stating his conviction, from information he had received from one of Ridgeway & Co.'s trustees, that there would be a very small dividend for the creditors.

Exchange of Publications.—The Secretary also read the following letter from the Secretary of the Anthropologic Society of Vienna, dated 13th Nov.:

Dear Sir,—By order of the Directorate of the Anthropologic Society, I have the honour to inform your Directorate that the Anthropologic Society will be happy to enter into the correspondence proposed by you as we are anxious to have in our library a complete copy of all your printed issues. I request you be good enough to send us a complete series of your *Timehri* against any exchange of ours.

Congress of Chambers of Commerce.—The Secretary laid over a communication from the London Chamber of Commerce inviting this colony to take part in the Congress of the Chambers of Commerce of the British Empire to be held in London about July next, in connection with the Colonial and Indian Exhibition. The matter was referred to the next meeting.

Treasurer's Accounts.—The Treasurer's statement to

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31st December, showing a balance on hand of $782 25 : and the Museum account showing a balance of $567 61, were laid on the table.

Sale of Surplus Books.—Mr. Kirke, with regard to the books which it was decided at last meeting should be sold, moved that they be at once handed over to the auctioneer to sell. Mr. Godfrey seconded this, and the motion was carried.

The meeting then closed.

Meeting held 11th February.—The Hon. W. Russell, President, in the chair.

There were 13 members present.

Elections.—*Member :* Charles H. Stuart.

Associate : Charles M. Kirkpatrick.

School of Art.—Mr. Kirke gave notice of a motion with reference to the establishment of a School of Art in connection with the Society.

The Library.—The President said that he had been requested to bring to the notice of members of the Society the great want in the Library of works of reference on engineering, agriculture, chemistry, et. cet. He, therefore, begged to give notice of motion that the Book Committee be requested to supply the necessary works.

Treasurer's Accounts.—The acting Secretary reported that the Treasurer's half-yearly statement of the Society's affairs had been audited, and certified to be correct.

Sale of Surplus Books.—The acting Secretary reported that the books ordered to be sold at auction that had been withdrawn from the library, had fetched a bid of only $20 at the sale, and were not sold. The In-

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spector General of Police had since offered $50 for the whole lot, for the purpose of adding them to the Police Library.

Mr. Imlach moved that the books be divided into lots, and presented to the Sailors Mission, the Colonial Hospital, Queen's College, Lunatic Asylum, Alms House, Berbice Hospital and the Essequebo Hospital.

The motion was carried.

Congress of Chambers of Commerce.—The acting Secretary brought up for consideration two circulars from the London Chamber of Commerce inviting this colony to take part in the Congress of the Chambers of Commerce of the British Empire to be held in London, in connection with the Colonial and Indian Exhibition.

After some discussion in which the opinion was expressed that the subjects to be discussed at the Congress were beyond the province of a colony of the size of British Guiana, it was resolved that Messrs. Hawtayne, Jones, and Ferris Grant should be the colony's representatives.

The Secretaryship.—A letter was received from Mr. T. Daly, resigning his post of Secretary to the Society, on the ground of ill-health.

Prize for Essay on Fibres.—The President stated that a gentleman, taking a warm interest in what is known as the minor industries, had authorized him to offer two prizes, viz., $100 for the best essay and $25 for the second, on Fibrous Plants; the essays to treat of the cost of growing, gathering and preparing for market, in detail, and to be accompanied by dried specimens of leaves, stalks, flowers, and seeds, of the various plants. As it was desirable to send the essays and spe-

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cimens to the Colonial Exhibition, the time for sending in essays, &c., would be restricted to six weeks.

Sugar.—Mr. Alexander, of *Tuschen de Vrienden,* laid over a diagram showing the average percentage of sucrose by volume in the juice from the canes grown on Pln. *Tuschen de Vrienden* during eighteen corresponding weeks in the last three years; and a second diagram showing the average percentage of glucose by volume in the same. He said the lines for 1885 showed very clearly the effect of the late droughts on the quality of the canes.

The President said that the diagrams shewed in a very conclusive way the variations in the quality of cane-juice derived from the product of the colony. The growth of the last year not only gave poor cane-juice, but also contained a very high percentage of woody matter,—he should think that 13 per cent. of woody matter would represent the fibre in our canes for the last twelve months. These facts, coupled with the very low price of our staple products—for not only sugar, but rum and molasses had been at stagnation prices,—made him astonished that we had been able to pull through as well as we had done.

Mr. Jones was quite certain that with the assistance of the able chemists we had in the colony we were going the right road in learning what to us in this colony was simply a matter of life and death; and the results of scientific research must certainly prove of great value to us in these hard times, in helping us to meet the great depression of our staple products. There was one matter to which he wished to attract the attention of engineers,—and that was,

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he would like to see more experiments made with reference to the crushing of canes, by slow and fast mills, and the result of the experiments communicated to the Society, with statistics as to the out-puts of the two or three years which had elapsed since hydraulic bearings were introduced into the colony.

A vote of thanks to Mr. Alexander was carried unanimously.

The President said, with regard to the question to which Mr. Jones had referred, that the most minute care was being taken to measure the quantity of hogsheads of sugar passed through fast and slow mills, and he hoped at next meeting to be in a position to have a paper laid before the Society, which would also give the results of hydraulic pressure as compared with the old system.

The meeting then ended.

Meeting held 11th March.—H. Kirke Esq., Vice-President in the chair.

There were 9 members present.

Election.—*Associate :* William Scott.

Prize Essays on Fibres.—The Chairman said in reference to the Prize Essays on Fibres, that the judges would be Mr. G. S. Jenman and Mr. R. Allan. Essays should be accompanied by at least 10 lbs prepared fibre, besides specimens of leaves, stalks, flowers and seeds of the various plants.

The closing date for receipt of competing essays would be two weeks hence.

The Secretaryship.—The Chairman said he had great pleasure in informing the meeting that Mr. Luke M. Hill

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had consented to fill the office of the Honorary Secretary of the Society.

On the motion of Mr. Pitman, seconded by Mr. Davson, a vote of thanks was passed to Mr. Sherlock, who had efficiently discharged the duties of Secretary during the indisposition of Mr. Daly.

School of Art.—The Chairman asked permission to postpone to another meeting his motion with regard to the establishment of a school of art and design in Georgetown.

State Publications.—The Government Secretary forwarded copy of a letter from the Lords Commissioners of Her Majesty's Treasury, stating that their lordships were unable to accede to the request of the Society to be supplied, at cost price, with Calendars of State Papers, and certain reports and papers issued by Her Majesty's Government.

Sale of Surplus Books.—Mr. Sherlock reported that the surplus books had been distributed as follows:—

Police Library...	150	vols.
Queen's College	100	„
Y.M.C.A.	100	„
Sailors' Home...	100	„
Essequebo Hospital	50	„
Georgetown „	50	„
Seamen's „	50	„
Berbice „	50	„
Lunatic Asylum	50	„
Leper Asylum...	50	„
Alms House	50	„
	800	vols.

Meeting held 8th April.—The Hon. W. Russell in the chair.

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There were 11 members present.

Elections.—*Members:* The Hon. C. Bruce, Government Secretary; Dr. A. D. Williams.

Prize Essays on Fibres.—The only essay received in reply to the offer of a prize for the best essay on the Fibres of the colony was from Mr. Rodway, who referred to the very short time given by the Society for the preparation of competing essays. He was awarded first prize.

Treasurer's Accounts.—The Treasurer laid over balance sheet showing balance of $1,907·83 at the 31st March last.

Notice of Motion.—Mr. Julius Conrad gave notice of two motions, proposing an appeal to the Legislature to amend the laws relating to married women's property and to foreclosure of mortgages, but he was informed that the Society could not entertain either of them owing to their political nature.

The Curatorship.—The appointment of Mr. Quelch, late assistant at the British Museum, to the curatorship of the Museum, was notified. He is a native of St. Kitts, a grandson of Commander Quelch, and was selected in England for recommendation to the Society by Mr im Thurn.

Meeting held 13th May.—H. Kirke, Esq., Vice President in the chair.

There were 13 members present.

Imperial Federation.—A letter from the London Chamber of Commerce was read, announcing a prize of £50 sterling for the best essay on Imperial Federation to be sent in not later than 31st August, 1886.

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The Chairman suggested that the press might be asked to give publicity to the matter.

Donation to the Library.—A letter from Government Secretary was read forwarding at the request of the Governor, for the information of the Society, a volume of the Patents and Patentees of the colony of Victoria, 1880. The thanks of the Society were accorded His Excellency.

Prize Essays on Fibres.—Mr. Russell in a letter forwarding cheque for $25 the prize for the Fibre Essay, expressed at the request of the donor his great regret that more interest was not taken in this branch of the minor industries, but hoped that the matter might now occupy more attention, after having been prominently brought before the public. Printed copies of the essay were placed on the table for distribution.

The Colonial Exhibition.—Extracts from Mr. Walker's letters of 24th March and 7th April were read. He had had some interviews with Mr. Hawtayne on Exhibition matters. Our Commissioner, at the request of Sir Philip C. Owen, had been compelled to give up some of the space originally allotted to British Guiana at the Indian and Colonial Exhibition, but this Mr. Hawtayne thought might be no great disadvantage.

Cattle Farming in Berbice.—Mr. Russell's paper on "Water Supply and Cattle Farming on the grand savannah, Berbice," was read by the Hon. Secretary. The paper was chiefly confined to a description of the country recently ridden over by Mr. Russell in company with Mr. Hutchens, Colonial Civil Engineer and Mr. M. B. Jamieson, District Engineer, during two days last month, and to the immense herds of fine cattle found grazing on

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the savannah, the numbers of which were estimated at 10,000 head. These cattle do very great damage to the various water supply canals ; and Mr. Russell suggested that the cattle owners should pay a small tax towards the maintenance of these canals and dams.

Mr. Hutchens made a few remarks corroborating Mr. Russell's estimate as to the number of cattle ; and the Chairman said as President of Lamaha Canal he could support Mr. Russell's views in regard to damage done by cattle, and the propriety of their owners' contribution towards the repair of such damage.

He suggested that the paper be brought up for further discussion or remarks at the next meeting.

The Treasurship.—Mr. Imlach, the Honorary Treasurer, announced his intended departure from the colony on leave of absence next month, and asked that some one be nominated to take over the duties of his office. The matter was left in the hands of the Directors.

Meeting held 10th June.—The Hon. W. Russell in the chair.

There were 28 members present.

Elections.—*Honorary Members :* Mr. J. McKillop of Tobago ; Dr. Nicholls of Dominica ; and Mr. C. J. Herring of Surinam were elected honorary members of the Society, in recognition of their valuable services in connection with the last Local Exhibition.

Members : Dr. J. Rowland ; Æneas D. McKay.

Associates : G. Lyon ; R. Sayler ; J. H. G. Russell.

Motion.—Mr. Conrad proposed the motion of which

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he had given notice, for the appointment of a committee to prepare a petition to the Legislature for an amendment of the law relating to the foreclosure of mortgages, but the President ruled it out of order on the ground that it did not come within the scope of the objects for which the Society was constituted.

Cattle Farming in Berbice.—The President referred to his paper on cattle farming submitted to the last meeting of the Society, and said he thought it ought to have been given to the press as the paper was meant to form the basis of public discussion. It was decided that the paper should be given to the press and discussion invited upon it at the next meeting.

Timehri.—The Chairman said it was very desirable that gentleman should write papers on subjects of general interest for *Timehri*, and support the journal in every possible way ; for, he regretted to observe that the subscribers, instead of increasing in number, were becoming fewer and if that process were not arrested, the publication of the journal, which had heretofore appeared likely to be very successful, would have to be discontinued.

The Treasurership.—The President announced that during the absence from the colony of Mr. Imlach, Mr. Bugle had kindly consented to act as Treasurer of the Society. A vote of thanks to Mr. Imlach for his very valuable services to the Society was accorded by acclamation.

Donations to the Library.—Votes of thanks to the acting Administrator General for three volumes of the Proceedings of the Royal Geographical Society ; to the Government Secretary for Consular Reports and a copy of the Blue Book ; and to a scientific association in Minne-

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sota, U.S., for copies of its proceedings, forwarded through the Smithsonian Institute, in return for which they desired to be furnished with the proceedings of the Society, also were passed.

Local Exhibition Medals.—The Secretary announced that the gold, silver and bronze medals awarded to exhibitors at the last Local Exhibition were received, and might be obtained on application at the Rooms.

Rice.—The President laid over a paper on Rice cultivation. This paper will be found at page 101 of the present number of *Timehri.*

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Notes on the Plants observed during the Roraima Expedition of 1884.

By the Editor.

AS was expected, the plants collected on the way to Roraima, and especially about the mountain itself, during the recent expedition to, and first ascent of, its summit, now that they have been examined and catalogued at Kew, have proved of great interest. Several specialists have most kindly lent their aid in examining and determining these plants. While Professor OLIVER undertook the bulk of the collection, Mr. J. G. BAKER, besides determining a few of the petalloid monocotyledons, has, aided by Mr. G. S. JENMAN of British Guiana, worked out the ferns; Mr. H. N. RIDLEY of the British Museum the Orchidiaceæ and Cyperaceæ; and Mons. E. MARCHAL the Araliaceæ. Again Dr. ENGLER has described a new Moronobea, Mr. BROWN a new Aroid, and Mr. MITTEN has named the Muscales. Lastly, Dr. MAXWELL MASTERS has supplied a note on two Passifloræ, perhaps new, but imperfectly represented. In all, fifty-three new species and three new genera have been described by these various workers.

The number of species collected would probably have been greater but for the extreme difficulty of drying plants in so excessively damp a climate as that of Roraima, and but for the fact that the other very serious labours inseparable from the ordering, and keeping in order, of such an expedition greatly curtailed the time I was able to devote to the preparation of botanical speci-

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mens. As regards the number of new forms collected, generic and specific, this, great as it is, would undoubtedly have been much greater but for the fact, unfortunate in this respect but fortunate in others, that my collection was made at exactly the same period of the year [November and December] at which such collecting as had been done before about Roraima, by Sir ROBERT and Dr. SCHOMBURGK and by KARL APPUN, had been accomplished.*

Probably, never has a district of equally small size,

* The list of visitors to Roraima other than Redmen is as follows. SIR ROBERT SCHOMBURGK, then at the head of a boundary commission, was there in 1838 and again, with his brother DR. RICHARD SCHOMBURGK, the present curator of the Adelaide Botanical Gardens, in 1842. Both made considerable botanical collections, which were distributed, I believe, mainly between the Herbaria at Kew, the British Museum and at Berlin. KARL APPUN was at Roraima in 1864; his collections are chiefly at Kew. C. B. BROWN, then the geological surveyor of British Guiana, was there in 1869; two Englishmen FLINT and EDDINGTON were there in 1877; and two others MCTURK and BODDAM-WETHAM were there in 1878. None of these five last made botanical collections. DAVID BURKE, an English orchid collector, was there in 1881, and brought home certain interesting living plants, among others the South American pitcher-plant (*Heliamphora nutans*), which has, I believe, since been distributed by Messrs. VEITCH & SONS. HENRY WHITELEY, an English collector of birdskins, was there on several occasions between 1879 and 1884, and, I believe, was again there in 1885, but has collected no plants. SEIDEL, a German orchid collector, was there in April 1884 and again, with us, in December of the same year. He brought back only living plants, especially the magnificent Cattleya Laurenceana, which has since been distributed by Mr. A. SANDER. Of these, SEIDEL, the only traveller with an eye for plants who has been at Roraima except in the last months of the year, assures me that the abundance of flowers was much greater there in April than in December. But in the latter months the Indians' cassava fields are in full bearing and provision is therefore much more easily attainable.

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after such brief and cursory exploration, yielded greater results, perhaps hardly has any such district yielded equally great botanical results as has Roraima; and still more probable is it that few such small districts are so distinctly marked off from the country immediately surrounding them by such great and remarkable peculiarity in their vegetation. In brief, the district of Roraima is, from a botanical point of view, chiefly interesting as an oasis clothed with a vegetation which is both in most marked degree distinct from that of the country which immediately surrounds it, and is at the same time, also in very marked degree, peculiar either to this special district or to this in common with a few other almost equally isolated, but widely separated, districts.

I cannot, therefore, it seems to me, devote these prefatory remarks, in which I have the privilege of introducing the list and description of my collection so kindly prepared by the authorities above mentioned, to a better purpose than to as emphatic a statement as I can make *of the isolated character, botanically, of the Roraima district, of its probable relation, botanically, to certain other probably similar districts,* and of the *general appearance of the very peculiar and distinct vegetation of these districts.**

The whole district known under the name of Guiana may be likened to a wedge driven into the north eastern shoulder of South America. Politically, it is thus placed between Brazil on the south and Venezuela on

* I use the phrase 'Roraima district' as including not only the mountain of that name but the whole of the small group of similar sandstone mountains of which Roraima is the best known, and at present the only explored member.

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the north. For our present purpose it will, however, be better to describe its position somewhat differently. The artificially formed political divisions of the continent corresponding very closely, for obvious reasons, with the tracts naturally differentiated each by its own river system, and it being along the river systems that the migration of animals and plants chiefly occurs, therefore the customary and convenient names of these political divisions really correspond somewhat closely with the natural and important differences in flora, as also in fauna, which distinguish the various river basins. Thus, as Venezuela is essentially the tract drained by the great river Orinoco, and as Brazil is essentially the tract drained by the great river Amazon, and as Guiana, intermediate between these two, consists essentially of the parallel tracts drained by certain comparatively, but only comparatively, small rivers, of which the Essequibo, the Demerara, the Berbice, the Corentyn, the Saramacca and the Maroni may be mentioned, so the political names, to mention them in their order from north to south, of Venezuela, Guiana, and Brazil, represent also natural tracts which are really more or less differentiated, each from the other in its flora and fauna.

Now, as the whole of the tract under consideration—that drained by the Orinoco, the Amazon and the intermediate rivers—rises gradually, or more generally by steplike ascents, from the sea-level on its east, toward the table-land on its west—the table-land of the centre of the continent—it is of course on this table-land that the rivers take their origin. And, as owing to the irregularity of the surface of this table-land, and still more that of its slope toward the eastern sea, it happens that

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each of these rivers collects its headwaters from unusually widely separated localities, and it often happens that two or more of these rivers draw some portion of their headwaters from unusually contiguous localities. Thus it is conceivable, and even probable that any peculiar vegetable forms, or animal forms, which may originate at one of these localities which supply water to very divergent river systems, may distribute themselves over very wide areas by passing along the courses of the various rivers arising there.

It happens that the rock-pillars of the Roraima group, rising some 5000 feet over the general level of the sea, pour down from their summit streams which go to swell the Orinoco, the Essequibo and the Amazon, in other words the three rivers respectively of Venezuela, Guiana and Brazil.

Now, as has been already indicated, the flora of Roraima is of a very remarkably peculiar character. A most interesting question, still awaiting solution, therefore arises, as to the relation of this flora of Roraima to the floras of Venezuela, Guiana and Brazil.

No answer, I say, has yet been attempted to this question; nor can I pretend to suggest that answer. I am, however, able to give, as data to be considered in the question, some very general account of the flora of Guiana, and a rather more special account of the flora of Roraima in its relation to that of Guiana.

Guiana, as has been said, rises gradually from the east toward the high table-land of the interior of the continent. But now, instead of thus placing ourselves in imagination on its seacoast and looking westward up its gradual slope, let us imagine ourselves on the

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table-land, on Roraima, and that we are looking eastward, down toward the sea. We should find, were such a bird's-eye view really possible, that the table-land, or savannah as it is there called, is an open, generally treeless country, its elevated surface hardly anywhere level, but swelling up in many hills and even in some mountain ranges. We find that only along the courses of the rivers, or in the lower parts where water has accumulated in some form, are there more or less extensive belts of trees; and that, on the savannah itself, even these trees are, considering that we are in the tropics, of no great size. Further eastward, on the lower part of the slope, toward the sea, where the rivers have already grown wider and approached each other more nearly, the trees are more in number and of larger size. Still further eastward, yet lower down the slope, the belts of trees, pertaining each to its own river, have widened with the rivers, till they have approached, and then joined, each other. And here the trees are of yet larger size. At last, at the bottom of the slope between its foot and the still far-distant sea waves, the wide tract of alluvial soil which has been deposited between the slope and the sea, having either been brought down by the rivers or cast up from the sea, is virtually entirely occupied by the omnipresent forest of trees, which have there attained their true gigantic tropical size. If we except certain small patches of very swampy open land, locally called wet savannahs, within this forest of the alluvial tract, all is forest except the very narrow strip of land actually washed by the waves, which has been cleared by men for habitation and cultivation, and not even that toward the north.

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Very different and distinct flora characterize the parts of Guiana thus variously conditioned; though, naturally, a certain number of species are common to all three.

Where the narrow sea-washed strip has been artificially disforested, a generally dwarf and weed-like flora, very largely consisting of non-indigenous plants, prevails.

Within the forest, perhaps the most noteworthy features of the vegetation after the generally great height of the trees and, often, the abundance of palms, are, in the first place, the great scarcity of mosses, herbage and low-growing plants, especially of any such with conspicuous flowers, and the consequent bareness of the soil, which is relieved by only a few scattered ferns, ginger-worts, caladiums and other aroids, dieffenbachias, cyperaceæ and other such shade-loving plants, and, in the next place, though this is hardly discernible from below, the abundance of the flowering creepers and epithytes spread over the matted tops of the densely placed, lofty trees. The representatives of the low-growing bright flowering plants of the thinner, lighter, woods of temperate climates have here, in this dense shade of the tropical forest, to send their immensely long flowerless creeping stems up some one or even two hundred feet, to reach above the highest tree-branches, before they can break into bloom. Only as semi-aquatics along the riverside are there a few showy flowered dwarf plants.

Quite different again is it on the savannah, where, among the grasses which, of course, form the chief vegetation, are scattered a considerable number of bright flowered dwarf plants,—though even here the abundance of bloom very rarely reaches the extraordinary develop-

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ment which it often does in the meadows of temperate climates. Rather striking, too, is it that, on these savannahs, of the bright-flowered plants many, unlike those of temperate meadows, are here also true climbing plants, legumes chiefly and various species of *Echites*, though their stems, instead of climbing far and high over giant trees, here only ramble weakly and briefly over the short grasses.

In each of these thus distinct floras, of the coast, the forest, and of the savannah, the number of species is, of course, great; but in each separate district the species characteristic of it are as a rule remarkably widely and evenly scattered throughout its extent. For example, within the forest district, probably by far the larger number of species have an unbroken distribution throughout the district from north to south, though they may be limited from east to west, according, that is to the greater or less distance from the sea or to the higher or lower position on the general upward slope of the country. On the savannah, the general level of which probably corresponds more or less closely with the general level of the main table-land of that part of the continent, the distribution of the main species is still more even and monotonous. On almost every part of the savannah certain grasses, certain dwarf shrubs and certain herb-like plants, form the main vegetation. Yet a few remaining parts are marked by the occurrence of certain distinct and, as for the convenience of the name we may call them, localized species, which are scattered more or less widely among the more ordinary forms. And again, a very few other parts are still more distinctly marked, are made very distinct areas, by the more or less com-

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plete absence of the more ordinary forms and the substitution within their limits of an entirely new and generally very distinct set of species. These areas with a few localized species, of which several were passed by us on our way to Roraima, and still more these areas of quite distinct vegetation, of which the Kaieteur savannah, across which we passed, and still more Roraima itself, are remarkably fine examples, seem of the utmost botanical interest.

A few notes must first be given of the species here described as localized. It must be remembered that these notes were made during a single walk, long as it was, through a country otherwise almost absolutely unknown; so that though these species were noticed by me because I saw them either only in one spot or at least in very few spots—*i.e.* I passed through either only one distinct group or through very few such groups of them—yet it is of course impossible to assert that many other such distinct groups do not occur wherever the requisite soil and other circumstances permit.

A considerable number of such localized species occur on tracts where the soil is of so peculiar a nature as to have earned a special name for such places from the Indians, who call them *Eppellings*. This name is applied by the Arekoonas to certain tracts in which the underlying substance of very soft sandstone is overlaid by a coating of hard dense and dry mud or, in some other cases, of hard conglomerate. Wherever, as is often the case, this hard mud surface is unbroken it resembles an asphalt pavement, or perhaps rather a floor made of hard-beaten earth. But this curious earth-surface overlies hill and dale alike, and is therefore not often level.

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Wherever, then, there has been the slightest crack in its surface, rain water gathers, and having once obtained a lodgment it eats away and enlarges the crack. The result is an eppelling surface which, instead of being like an asphalt pavement, is like a pavement formed of irregularly-shaped and scattered flag-stones. But again, the mud-layer which overlies the eppelling being by no means thick, whenever this has once been indented, as just described, by many cracks enlarged by water, these cracks are soon engraved through the mud-layer down to the soft sandstone below; and, when this has once occurred, the sandstone thus exposed, which yields to the action of the water even more readily than does the hard mud, is rapidly worked out. In this way the eppelling is made to assume the form of a number of blocks, often pillar-like, of sandstone, each of these blocks being capped and protected by a patch of the original hard earth, or, in other cases, of the original conglomerate.

Now, where the original eppelling surface is unbroken, in which state we have compared it to an asphalt pavement, it is as entirely devoid of vegetation as such an artificial pavement would be. But where the surface of the eppelling has reached its furrowed stage, a few plants find lodgment, chiefly certain orchids and other such plants, of which the roots are of such a nature that, in the dry season, when the furrows are water-less, the whole plant shrinks into complete rest, and even in some cases loses its root-hold and is blown about on the surface of the eppelling until, when the next rains come, it again throws out anchor-like roots into some new furrow. One orchid of this wandering tendency is a Catasetum (C. cristatum?) [No. 148]; another is

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the new, and very beautiful *Oncidium* named and described by Mr. RIDLEY in the appended list as *O. orthostates* [No. 12]. Sometimes, too, in this same state of the eppelling, especially where such ground occurs on the brows of exposed hills, shrubs of considerable size find anchorage in the furrows and flourish. One such hill-top which we passed was made very beautiful in this way by a large and isolated patch of the large rosy flowered *Bonnetia sessilis*, BENTH, [No. 11]. In another similar place we passed through a distinctly marked patch of the compact *Stifftia condensata*, Baker, [No. 10]. And more than one such place was distinguished by thickets of *Gomphia guianensis* [No. 15].

Lastly, as regards the eppellings, where the furrows of these places have been worked down into the sandstone, and have been much enlarged, the deep ravines and pits of all sizes thus formed, though bare of vegetation wherever the process of water-washing still continues in violent action, are where this action has ceased, owing to the stoppage of the outlet, or has become much moderated, compatively thickly clothed with vegetation.

Another remarkable localized plant, though not occurring on an eppelling, was the beautiful *Aphelandra pulcherrima* [No 14]. It has already been said that even on the otherwise open savannah, more or less extensive belts of forests often clothe the sides of the narrower parts of the valley through which the rivers run. One such place we came to, where, after crossing the Ireng river and the low watershed which there separates that river from its tributary the Karakanang, we were descending toward the level of the last-named river. It was here that, in a somewhat extensive wood

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of which most of the trees were common species of *Cassia*, we found the dense, shrubby underwood to consist almost entirely of this beautiful, scarlet flowered *Aphelandra.*

Throughout a small tract on either side of the Ireng river, where the ground was almost entirely covered by a gravelly layer of shattered conglomerate, a very beautiful herb, with flowers of an intense violet blue—a very rare colour in Guiana,—was common and pleasantly reminded me of our English 'vipers bugloss.' It was *Stachytarpheta mutabilis. v.* [No. 1], which seems to me to correspond to my description of a localized species.

Again, between the Ireng and the Cotinga rivers grew in abundance, and evidently as a native, a plant [*Fourcroya gigantea*], which, common enough near the coast of Guiana in cultivation, is nowhere else, as far as I have seen in many wanderings, wild in that colony.

Lastly, as regards localized species, I would mention several dwarf bamboos, none of which unfortunately did I succeed in finding in flower. One of these, a wonderfully graceful species, appears to me peculiar in Guiana, in that it grows in dense thickets, on the open savannah. This was on the Ireng river, and more sparingly onward from there toward the Cotinga. Another of these bamboos (*Chusquea* [sp. ?] No. 18), I think the most graceful plant I ever saw occurred sparingly, and only in one spot, on the Arapoo river close to the village of Tooroiking. A third bamboo, a climbing form [No. 359], occurred to me first on the same river, but is much more common on Roraima itself, and should perhaps be spoken of in connection with the vegetation of that mountain.

Turning next to the areas of distinct vegetation, the

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first to be mentioned is that of the Kaieteur savannah.* This is certainly a very remarkable place with a very remarkable vegetation. It is an open space, some two miles long by one across, in the heart of the ordinary dense forest, and some four days' journey on foot from the nearest open country. It has been said that the descent from the table-land of the interior toward the sea is not a gradual slope but occurs chiefly in a series of steplike descents which are generally of no great individual height. But the descent at the Kaieteur takes the form of an almost abrupt cliff—at the Kaieteur fall itself it is an actual cliff—of between seven and eight hundred feet in height. The Potaro river, rising apparently from the neighbourhood of, but not actually on, Roraima, after an unknown upper course of considerable length, here runs along one side of the almost perfectly level Kaieteur savannah and precipitates itself, at the east end of that savannah, down the abrupt descent of 800 feet. The savannah itself is virtually a flat exposed rock, many parts of which are as absolutely bare as a London pavement. This rock is sandstone, which, as in the eppelling—indeed it probably is an eppelling, but of unusually unbroken surface—is capped by a harder material, by a layer of conglomerate. Just as the hard surface of the eppellings cracks and eventually affords roothold in the fissures thus made for plants, so the hard conglomerate covering of the Kaieteur savannah has cracked, and in many of the fissures thus produced has given root-hold to plants.

* A very instructive paper on 'The aspect and flora of the Kaieteur Savannah' by Mr. G. S. JENMAN, F.L.S., is to be found in the firsr volume of *Timehri*, p. 229.

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Some of these latter fissures have gradually been filled up by the accumulation of vegetable matter; others remain still open. On this savannah, however, the fissures are larger than is commonly the case in eppellings, are in fact often very long, though generally narrow. Many of these are now entirely occupied by shrubs and dwarf trees. The lines of these masses of vegetation, necessarily following the lines of the fissures, present, in most remarkable degree, the appearance of the well marked lines designed by a landscape gardener; and the whole effect is as of an artificial garden, with regular groups of shrubs separated by wide paths and roads of clean bare rock. Moreover it is not only in the fissures that plants grow on this savannah. As on the eppellings so here to, a certain number of plants find sufficient roothold in the vegetable accumulations in the slight depressions in the conglomerate sheet before these have been engraved deeply enough to leave the sandstone exposed and to make regular fissures.

But not only is the arrangement of the vegetation of the savannah thus very remarkable. The plants composing this vegetation are also individually of great interest. As might be expected, very few of them occur in the forest which everywhere, and for a great distance, surrounds this strange open space. Much more remarkable is it that very few of these plants occur on the nearest savannah, nor indeed, on the general savannah land of the interior. And most noteworthy of all is it that a very large number of these peculiar plants of this isolated savannah occur, often with slight but interesting differences, on Roraima.

By far the most striking, as it is also the most abun-

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dant, plant on the Kaieteur savannah is a huge aloe-like Brocchinia (*B. cordylinoides*, Baker) which was gathered there by Mr. JENMAN and myself some years ago but which was, until the Roraima expedition, unknown from elsewhere. This gigantic plant, of such striking aspect as to compel notice even from the most unobservant traveller, is ranged in enormous numbers over the Kaieteur savannah, and indeed makes, to a large extent, the strangeness of that strange scene. There the height of a full grown specimen is, under the most favourable circumstances, about 15 feet; and, in the older specimens at least, the crown of leaves is supported on a tall bare stem. It seems also there to flower abundantly. We shall see that the plant occurs, but with slightly different characters, on Roraima. Moreover, at the Kaieteur, in the axils of the leaves of this *Brocchinia*, and only in that position, grows a very remarkable and beautiful Utricularia *(U. Humboldtii.* Schk.), with flower stems 3 or 4 feet long, supporting many splendidly large violet flowers. This plant too we shall find on Roraima, but also with slightly different characters from those which it exhibits at the Kaieteur. Another remarkable and distinct plant on the Kaieteur savannah is a low-growing Brocchinia *(B. reducta,* Baker), also previously known only from there, which may be roughly described as resembling three or four sheets of yellowish grey foolscap paper, rolled loosely one round the other, the whole standing on one end of the roll. This plant I did not observe on Roraima, though I feel convinced that it will one day be found there; but I did see it, in very considerable quantity, in one small district about half way between the Kaieteur and Roraima. Only one other

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plant common, but with a difference of form, to the two districts can be mentioned here. Mr. JENMAN found at the Kaieteur a very striking new Moronobea (*M. Jenmanni)*; and I found on Roraima another very striking new Moronobea (*M. intermedia, N. sp., Engler* No. 337) of which its describer, says that its intermediate between *M. riparia* and *M. Jenmanni.*

In short, the Kaieteur savannah and Roraima may be regarded as two isolated areas marked by the very peculiar vegetation, which vegetation is, however, to a noteworthy extent, common to the two.

Before passing on to the district of Roraima, I may mention that if I may judge from the reports of the Indians, and of the one or two white men who have been there, savannahs curiously like this very remarkable example at the Kaieteur occur (1) above Amailah fall on the Curiebrong river, a tributary of the Potaro, (2) above Orinidouie fall on the Ireng river, and (3) above a certain very large fall which is reported to exist—indeed I have myself heard the roar of its waters—on the Potaro, about two days boat journey above the Kaieteur. In each of these places the large and not easily mistakable *Brocchinia cordylinoides* is credibly said to occur; and it seems highly probable that, with this, some of the other, but less conspicuous, plants of the Kaieteur occur also on these other savannahs. In short, it may very probably be that each of these reported fall-savannahs is a distinct area, parallel, and similar in vegetation to the Kaieteur savannah and to Roraima. In passing it may also here be noted that apparently a *Brocchinia*, similar to *B. cordylinoides* occurs on the Organ Mountains near Rio

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in Brazil, reached by GARDNER in 1837, and that in the axils of its leaves occurs an Utricularia (*U. nelumbifolia*,) which, to judge from GARDNER'S passing descriptions, must be strikingly similar to *U. Humboldtii* as it occurs on the Kaieteur savannah.* Possibly, nay probably, the Organ Mountains, too, resemble in some other of their vegetable features the Kaieteur savannah and Roraima.

Let us now pass to the consideration of Roraima itself as an area of distinct vegetation. And in so doing a few words must just be said to recall the physical features of the mountain.

Roraima is one, certainly the best known, perhaps the most remarkable, of a group of pillar-like sandstone mountains capped with hard conglomerate, which group is, it seems to me, identical in nature and origin with the groups of sandstone pillars, capped with conglomerate or hardened mud, of the eppellings already described. In short, Roraima and its fellow mountains seem to be an eppelling on a gigantic scale. Some notion of how large the scale is may be gathered from the facts that Roraima itself, one pillar of the group, is almost exactly four miles wide along its south-eastern face, and is apparently seven or eight miles long from south to north, and that its height is some 5,000 feet above the general level of the plain from which it rises.†

* Gardner's description of the vegetation of the Organ mountains (see his "Travels in Brazil." London, 1849. Especially pp. 50–52 and 402–403) reads extraordinarily like an account of the vegetation of Roraima. The height of the two elevations is about the same, but the Organ range consists almost exclusively of granite, not, as does Roraima, of sandstone.

† In a recent number of the Proceedings of the Royal Geographical Society (June 1886) is a paper by Mr. James W. Wells, C.E., on a

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This 5,000 feet of height, it must be explained, is made up of a sloping base, the pediment of the pillar, of about 3,000 feet, which is surmounted by the more strictly pillar-like portion, 2,000 feet in height. The plateau on top of the pillar is a very slightly, indeed almost imperceptibly, hollowed basin—four miles wide by some seven or eight miles long, it must be remembered—over which are scattered innumerable single rocks and piles of rocks, the largest of which are apparently some eighty or ninety feet in height. The sloping basal part of the mountain is, everywhere but toward the south-east covered by dense, but not lofty, forest; while on the south-east a considerable portion of it, which portion does not however extend up to the foot of the actual cliff, is treeless and grass-covered. The cliff itself is bare, but for a comparatively few mosses, ferns, grasses and trailing plants clinging closely to the rougher parts of its surface, especially where the many water-falls trickle down the rock-face, and for the dwarf shrubs, ever dwarfer and more alpine in character toward the top, which have found a lodgement on the few transverse ledges which break the evenness of the surface. The hollow basin at the top of the pillar is, wherever a little soil has accumulated in the depressions of the bare

group of mountains apparently very similar in physical feature to Roraima, though on a much smaller scale, which he discovered further south on the continent. Mr. Wells was kind enough to show me a series of his sketches of these mountains and the country surrounding them. Not only was the similarity of the mountains to Roraima striking, but I was also much struck by some sketches of places exactly corresponding to what I have described as *Eppellings*. Mr. Wells, while disclaiming all botanical knowledge, assures me that the vegetation of his group does not correspond with that of Roraima.

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rock which constitutes the greater part of its surface, clothed with a dwarf herb-like vegetation of most remarkable appearance, consisting largely of various species of *Pœpalanthus*, a *Drosera*, a few terrestrial orchids—these not very conspicuous in flower—, a remarkable low growing aloe-like *Abolboda* of which I shall have more to say hereafter, various ground-clinging shrubs, of Alpine, vaccinium-like, character, and of a very few single shrubs, all of one species [*Bonnetia Roraimæ Sp. N.* OLIVER No. 330], of larger growth, though even this is but some three feet high.

Nor in this brief sketch of the physical features of Roraima in their bearing on the vegetation is it possible to avoid mention of the great moisture of the atmosphere which surrounds the mountain. The shallow basin of the upper plateau ever holds much water, and probably at times is almost full; the sides of the cliff are ever moistened by the innumerable rills and streams poured down from the plateau above to the sloping base; and this basal portion itself is, on the more level, undulating parts of its exposed surface, a mere spongy swamp, while in its forested parts it is traversed by almost innumerable rills hastening down to join the large rivers of the plain below.

As when dealing with the vegetation along our line of march to Roraima I pointed out that I could only pretend to speak of the plants actually along that line, so in now dealing with the vegetation of Roraima itself I can only speak of that of the south-eastern side of this mountain, which alone I was able to examine closely. We spent nearly a month on this side, where it is comparatively treeless, savannah-like and swampy; and we climbed to

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the top of the mountain by a ledge running obliquely up this south-eastern face of its cliff.

It was not till we reached the top that we saw the most remarkable features in the wonderful plant-life of this very distinct area of vegetation; but even while only approaching the base of the mountain, which for convenience of description I will take to be marked, on the south-eastern side, by the bed of the Kookenaam river, and while we were still far off we saw for the first time plants which we afterwards found commonly on Roraima—the out-posts, as it were, of the remarkable group of plant-forms centred on Roraima. And from the moment when the first of these distinctive plants of the mountain was met with till the moment, some weeks later, when we reached the top we ever travelled onward into a more and more peculiar flora.

Our discovery on the savannah, a full day's journey from Roraima, of the first out-post of the vegetation of that mountain was a very distinct event. We found a well-marked dense patch, perhaps some 40 yards in diameter, of *Abolboda sceptrum, nov. sp.* OLIVER, [No. 312], a compact and dwarf, yucca-like plant—a rosette, perhaps a foot and half in diameter, of most acutely needle-pointed leaves. This plant appeared again in patches once or twice before we reached Roraima, and formed much of the turf, as it were, both of the savannah slope of the base of that mountain and also on the top. Wherever it appeared, it was a constant source of annoyance and of danger, not only to the naked feet of my Indian companions, but also to our own canvas-clad feet. Luckily, a rumour which in some way

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spread among us that these rosettes of vegetable bayonets were poisonous, after causing some rather comic alarm, proved groundless. Where we first found the plant, as also on the sloping base of the mountain, it was out of flower, and though its withered flower-stems were extant, was even already seedless; but on the top we found it in full and striking flower. From the centre of the rosette of leaves rises a single stem, perhaps eighteen inches in height, crowned by a very regularly formed whorl of dependent yellow flowers. The general appearance—the *facies*, to use a term recognized by botanists—was remarkably like that of the yellow form of the Crown Imperial (*Fritillaria imperialis*). For the botanical description of this interesting plant, as indeed of all the other new plants of which I shall attempt to describe the *facies*, I must refer to the list carefully worked out at Kew. *

After passing the first station of *Abolboda sceptrum*, till we reached the actual foot of Roraima, at the bed of the Kookenaam river, we continued through a country over which, though it was still furnished chiefly with the ordinary savannah vegetation, were scattered a few new plants; and indeed as we advanced we met with an ever increasing number of these. Across this tract, about half-way between the station of *Abolboda* and the Kookenaam, flows the Arapoo river, which, falling down from Roraima, has its course marked in a

* It may be here mentioned that three volumes of admirable original sketches of British Guiana plants made under the direction of (Sir Robert?) Schomburgk exist in the Herbarium of the British Museum. Among these sketches are to be found many Roraima plants, and, among others, *Abolboda sceptrum*.

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pronounced way by plants characteristic of that mountain, such as *Marcetia taxifolia* Tr. [No. 68], *Cassia Roraimæ*, Bth. [No. 71], *Dimorphandra macrostachya*, Bth. [No. 39], *Meissneria microlicioides* Ndn. [No. 174], *Calea ternifolia*, Oliver, *N. sp.* [No. 27]. To me the most interesting plant on this river was a very beautiful little slipper orchid *(Selenipedium Klotzschianum,)* Reich. fil. [No. 31], which grew in the moist gravel of the river bed, where the plants must frequently be under water. This plant we also found in great abundance on an island in the Cotinga river, another of the Roraima rivers, and on a small creek, called *Aroie*, a tributary of the Cotinga. Naturally the Arapoo river, as are its fellows flowing from Roraima, is an artery allowing of the dissemination of plants from that mountain.

At last we reached the Kookenaam river at the village of Teroota—at the base, that is, of Roraima. But even on, beyond the bed of this river, for some distance up the slope of the mountain, the tract of ordinary savannah vegetation still continues, its characteristic plants, however, ever becoming more and more penetrated by plants belonging to the Roraima flora, till the very distinctly marked zone of strictly Roraima vegetation is reached.

The course of the Kookenaam river, where it here flows through the tract of neutral vegetation—vegetation, that is, not yet deprived of ordinary savannah plants and not yet composed exclusively of Roraima plants—is, as was the course of the Arapoo river already described, —very well defined by the large number of Roraima plants clustering on its banks. Among these may be

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mentioned various shrubs *Ilex Macoucoua*, Pers [No. 75], *Dipteryx reticulata*, Beth [No. 73], *Myrcia Roraimæ* Oliv, *N. sp.* [No. 74] and *M, Kegelianæ* Berg *aff* [No. 82]), which in places fringe the banks of this stream and are also characteristic of the upper, proper, flora of the mountain. Along the banks of this river, too, after its emergence from the mountain, grows, in the peaty soil at the water's edge, a very beautiful and sweet scented white orchid, *Aganisia alba*, Ridley *N. sp.* [No. 360] and, on the more rocky parts of the bank a very remarkable red passion flower [No. 84] with panicles of many pendent flowers, each panicle having the appearance, the facies, to use that ugly but convenient term again, of a spray of fuchsia blossom. * It was here too, in the deep cuttings made by the river and half filled up with huge blocks of stone which are now overgrown with gnarled trees and shrubs, that one of the most famous of all Roraima plants grows—*Cattleya Lawrenceana* Rch. fil. *N. sp.* [No. 80].

This Cattleya is doubtless the one collected by the SCHOMBURGK brothers, and enumerated by RICHARD SCHOMBURGK, as *C. pumila*; for it appears to be the only representative of this genus occurring on this side, at least of Roraima; and this was the only side visited by the SCHOMBURGKS. It grows, apparently not high up on the mountain, but on the gnarled tree trunks, close to the water, in the clefts through which the Kookenaam and some of its small tributary streams flow, at a height of about 3700 to 4000 feet above the sea. At the time of

* This passion flower is well figured in the Schomburgk drawings of which mention has already been made.

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our visit, Mr. SIEDEL, an orchid collector, having set the Indians to work to collect this plant for him, I have seen these people, ten or twelve of them, come into camp, afternoon after afternoon, each laden with a basket, a good load for a man, full of these lovely plants, many of them then in full flower. One day, too, I myself, having gone down to the Kookenaam to bathe, just round the small pool I choose for that purpose, gathered two most glorious clumps of this orchid, the better of the two having five spikes of flower, of which one spike bore nine, and each of the others eight blossoms, in all forty-one of some of the largest and loveliest coloured Cattleya flowers ever seen, on a single small plant, the roots of which easily lay on my extended hand.*

Before now dealing with the plants actually of Roraima, it will be convenient to say a few further words as to the form of this south-eastern face of the montain.

From the bed of the Kookenaam at Teroota [3751 feet above sea level] the mountain slopes, somewhat gradually, though of course not evenly, upward, for a distance of about three miles, till a height of 5000 feet is attained. This last mentioned point is that to which a considerable number of the plants belonging to the ordinary savannah vegetation of Guiana ascend.† From this point the mountain rises, at first somewhat more abruptly and then again more gradually, so as to form,

* Full description of the Cattleya have been given in the *Gardener's Chronicle*, Vol. 23, pp. 374-5. See also *Timehri*, Vol. 4 and Vol. 5.

† The most conspicuous of the few plants of the ordinary plain which ascend above this point are Sida linifolia, Polygala hygrophyla, H.B.K., P. longicaulis, H.B.K., P, variabilis, H B.K., Drosera communis, A. St. Hil, Pleroma Tibouchinum, Sr., Sipanea pratensis Aubl., Pectis elongata, H.B.K., Gnaphalium spicatum, Lam.

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as it were, a terrace about midway up the slope. The upper level of this terrace, which lies at a height of about 5400 feet, is almost everywhere swampy, though here and there a few rocks crop out. This is the place so enthusiastically described by Dr. SCHOMBURGK, on account of the extraordinary richness of its vegetation, as a 'botanical El Dorado'; and it was here too, just within the forest which edges this swamp that we built our home and made our head-quarters. It is to this point too that the open savannah extends, for above, all is more or less densely forested. Behind this swamp, which caps, as it were, a terrace, half-way up the face of the mountain is a ravine; and again beyond this ravine, in which it must be remembered that the forest begins, the mountain slopes up very abruptly to a height of about 6,500 feet, to the base, that is: of the actual cliff. In the accompanying diagram (p. 170) all up to the ravine is distinguished as the savannah slope; all above, to the base of the cliff, as the forest slope. It should be noted that the forest slope is not uniformly clad with trees. The lower part is densely wooded, covered as it were, by dense jungle; next comes a belt of bush, rather than of jungle; while still higher, just under the cliff, the masses of rock which have fallen from above, lie like a moraine, on which are scattered, however, sparse trees, the low, wide-spreading branches of which interlock in a remarkable way.* The actual face of the cliff is, of course, bare; but wherever ledges run up for any distance these are often tree or bush clad; and

* This moraine-like part of the slope is curiously like the well-knowu 'Wistman's Wood' on Dartmoor.

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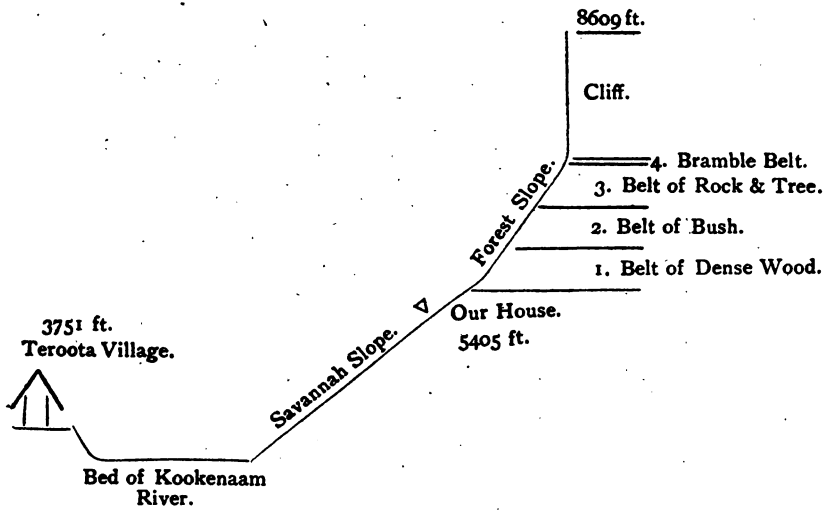
Section to illustrate the character of the ground occurring on S.W. slope of Roraima.



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the one ledge which runs right up to the top, the one by which we ascended, is bush-clad to a point about two-thirds up, then bush-less but plant-covered.

In the ascent from Teroota up to about 5000 feet, nearly up, that is, to the commencement of the El Dorado swamp, we met with many plants new to me scattered among the usual savannah plants. Conspicuous among these were three orchids, two growing on bare pebble-covered ground, the third on the huge boulders scattered over the slope. The two former were *Cyrtopodium parviflorum*, Lindley, [No. 55] with its handsome spike, often eighteen inches high, of many yellow and purple flowers, and the delicately beautiful white-flowered *Koellensteinia Kellneriana*, Rch. f., [No. 61] which latter grows also on the Kaieteur savannah. The third of the above mentioned orchids was the curious *Masdavallia brevis*, Rch. f., [No. 286] with flowers more remarkable than beautiful. Another striking new plant, also growing on the boulders of this part of the slope, was a remarkably handsome and large *Puya* (?) [No. 25] with flowers of a magnificently deep indigo-blue,—a colour so rare in the tropics. This *Puya* Mr. Baker tells me is probably a new and interesting species, but the dried specimens of it which I deposited at Kew are unfortunately not sufficient for its determination. I have, however, some fine young living plants of the species.

I come now to the description of the El Dorado swamp, for the place is really so remarkable botanically as to be worthy of distinction under this name. It is worth also another effort to give some picture of the appearance of the place. The swamp—botanists will understand that

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the rather dismal suggestions of this word are often, as certainly in this case, undeserved—lies on a terrace midway up the mountain. Its surface is very uneven, and it is consequently much wetter in some parts than in others, its flatter parts and its hollows so saturated with wet that the foot of one who walks there sinks often up to the ankle, its higher parts islands, rarely of any great size, of dry ground scattered through the swamp. Often, too, from these dry islands considerable groups of rocks crop out and sometimes rise to a considerable height. In the wetter parts, the grass, which of course forms the main vegetation, is every where high, rank and coarse; on the islands of drier ground the grass is finer and even turf-like; from the actual rocks grass is absent. Each of these two aspects of the swamp, wet ground and dry rocky island, presents a distinct vegetation, of which almost the only common feature is distinction from the vegetation outside this El Dorado.

Mingling and vying in height with the rank grass* of the wet parts, their flowers mingling with the blossoms of the grasses, are plants of wonderful beauty. The ever lovely, violet-flowered *Utricularia Humboldtii*, Schomburgk [No. 43], is there, growing, not as on the Kaieteur savannah as an epiphyte, but with independent roots in the ground; but of this I shall have more to say presently. The *Abolboda* is there too, in a form slightly larger and much less compact than is natural to it when growing on drier ground. The flag-leaved, yellow-

* The grasses chiefly noticed at this place were Paspalum stellatum, Flugge; Panicum nervosum, Lam.; Arundinella brasiliensis, Raddi.

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flowered *Xyris setigera*, Oliv., *N. sp.*, [No. 62] is there. The small pink-flowered *Begonia tovarensis Kl.* [No. 141] is there. A very few plants of *Brocchinia cordylinoides.* Baker, just two or three single specimens, are there; but of this too, I shall have more to say presently. Various ferns are there, especially the magnificent Cycad-like *Lomaria Boryana.*

And many orchids are there; a 'lady's slipper' *Selenipedium Lindleyanum* Reich. fl. [No. 53] with huge branched flower stems, each bearing many blooms, the whole plant, flower leaf and stem alike, all velvety in texture, and of various shades of one colour, the colour of sunlight as it falls through young green beech-leaves; the beautiful *Zygopetalum Burkei*,* Reich. f. [No. 50], with flowers seeming like gigantic, pale coloured "bee orchises', (*Ophrys apifera*, Huds) but of far sweeter scent; in great abundance the rosy flowered *Pogonia parviflora* Reich. fi. [No. 115], which recalls in habit our English wild tulip (*Tulipa sylvestris*); and, to mention but one more among many, *Epidendrum elongatum*, Jacq. [No. 42], its stems varying in height from one to eight feet, its verbena-like clusters of flowers varying in colour in different plants, some pale yellow, some fawn colour, many pure rich pink, dark purple and even mauve. This last mentioned orchid, it may be noted in passing, is one of a group to which I shall presently refer.

The effect of the whole is of an Alpine meadow, coloured in early summer by innumerable flowers of the brightest and most varied tints.

* This is represented on the Organ mountain by Z. Mackaii.

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If this tall vegetation be anywhere parted by the hand of the curious traveller, underneath it is seen a carpet of other, low growing, plants—*Pæpalanthus Schomburgkii*, Kl. [No. 33] and *P. flavescens*, K. [No. 60] *Drosera communis* A St. Hil. [No. 313], a pretty little orchid, *Spiranthes bifida*, Ridley *N. sp.* [No. 342], ferns, lycopodiums and sphagnum-like mosses.

One, perhaps the most remarkable, plant of the swamp has not yet been noticed. It is the South American pitcher-plant *Heliamphora nutans*, Benth [No. 258], which grows in wide-spreading, very dense tufts in the wettest places but where the grass happens not to be long. Its red veined pitcher-leaves, its delicate white flowers raised high on red tinted stems, its sturdy habit of growth, make it a pretty little picture wherever it grows. But it attains its full size and best development, not down here in this swamp, but up on the ledges on the cliff of Roraima and even on the top.

The vegetation of the drier, rocky patches is very different. A few shrubs of from four to eight feet in height and a very few stunted and gnarled trees are there; a few single specimens of the one Roraima palm *(Geonoma Appunniana)* which, as will presently be told, is much more abundant higher up; but more abundant are certain very dwarf shrubs of curiously alpine aspect, such as *Gaultheria cordifolia*, *H.B.K.* [No. 103] and various trailing plants, such as a black berry (*Rubus guyanensis*, Focke, [No. 106]), of which I shall have more to say hereafter, and a passion flower [No. 110] and a few orchids and ferns.

Of these orchids the most noteworthy is *Oncidium nigratum*, Lindley [No. 114], its delicately thin but wiry

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and much-branched stems, five feet high or more, seeming to hold suspended in the air a crowd of innumerable, tiny, butterfly-like flowers of cream colour and black; but two others, *Zygopetalum Burkii*, and *Epidendron elongatum*, which we have already seen in rank luxuriance in the wetter parts of the swamp, grow also on these drier parts, and are here much reduced in general habit but with larger and brighter coloured flowers. Of the ferns the most striking are a beautifully delicately cut *Schizæa* (*S. dichotoma*, Sw. [No. 100]), and a very remarkable Gymnogramme (*G. elaphoglossoides*, Baker, *N. sp.* [No. 101 and 215]), of which more hereafter.

Again, the tiny coppices which are in the swamp, and the forest which bounds it—which forest, it must be remembered, covers on the other faces of the Roraima slope what is here swamp—are full of interesting trees. One, with vast numbers of large magnolia-like white flowers is *Moronobea intermedia* Engler *N. sp.* [No. 337], the new species already alluded to as very closely allied to a second new species, *M. Jenmani*, which occurs in corresponding circumstances on the Kaieteur savannah. Another abundant tree represents an entirely new genus *Crepinella gracilis*, Marchal [No. 192]; another is a new species of *Sciadophyllum* (*S. coriaceum*, Marchal, [No. 128]). Another common and strikingly beautiful tree is a variety of *Byrsonima crassifolia*, H.B.K. [No. 130], with leaves the under surfaces of which are tinted with so deep and rich a violet as to impart a very striking violet shade to the whole tree, even when it is seen from a distance. Under the shade of these, and the host of other trees, ground, shrubs and tree trunk alike are swathed in thick green mosses.

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There too, but half clinging to the tree-trunks, are various species of *Psammisia* [Nos. 56 and 49], woody stemmed creepers, the innumerable drop-like crimson flowers of which, as they catch the tiny gleams of light striking down between the thick leaves of the forest roof, glow with intense colour. In these shady, moss-covered, quiet places, too, stand erect many tree ferns [Nos. 92, 270, 87, 37] and a very beautiful new aroid (*Anthurium roraimense*, N. E. Brown, *N. sp.* [No. 264]), its huge heart-shaped leaves and large arum-like flowers, of purest white, carried high on a slender but stiff stem. There, too, are innumerable ferns of wonderful interest, and many, but not showy orchids. Especially of the latter family many of those tiniest and most delicate species which if seen under a powerful magnifying glass, would rival the most showy, the most graceful of their kindred of our hot-houses.

We must pass now to the forest slope, which, as has been told, consists of three fairly distinct belts or zones, which I have called respectively, beginning from the lowest, the jungle belt, the bush belt and the belt of rock and tree.

The jungle is most densely interwoven of many tall shrubs or dwarf trees, which are yet more closely knit together by vast quantities of a climbing straggling bamboo (*Guadua* [No. 359]), of a Cyperaceous plant, *Cryptangium stellatum*, Boeckler [No. 357],) with rough, knife-edged leaves and tall weak stems; which support themselves on, and at the same time densely clothe, the shrubs among which the plant grows,* and of

* This is Schomburgk's Leiothamnus Elizabethæ.

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gigantic (that is, gigantic in the size of the thickets, which from the communal habit of the species it forms) and handsome climbing fern (*Gleichenia pubescens H.B.K.* [No. 343]). Among the shrubs also are two palms; one, in vast quantities, a very stout and erect stemmed, large leaved *Geonoma,* before mentioned, (*G. Appuniana* [No. 382]); the other occurring only in a few scattered examples, a *Euterpe,* possibly *E. edulis* Martius [358] but, if so, in a most remarkably stunted and dwarfed form. It is worth noting here that, despite the reported specific abundance, by SCHOMBURGK and APPUN, of palms about Roraima, these are literally the only two plants of that family which I saw on the mountain. Under the shrubs forming this jungle the ground was everywhere swathed with mosses closely intermingled with innumerable ferns, especially filmy ferns; and this mossy covering reached up over the tree stems and branches everywhere but where the sunlight fell. Under the shade of these shrubs, too, in the darkness and damp, grew various high-drawn terrestrial orchids, pallid plants with inconspicuous and pale flowers, such as *Stenoptera viscosa* Reich. f. [No. 131].

Undoubtedly the most striking feature of the vegetation of this jungle belt was the marvellous abundance and variety of the ferns. Of these, two seem to require special mention here. One is the Gymnogramme [No. 181] already mentioned as occurring also on the rocks in the swamp, and which indeed was abundantly distributed from the swamp nearly to the top of the mountain. It will be further mentioned in connection with a closely allied species occurring on the top. The second fern to be distinguished represents a very remarkable new

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genus, on which Mr. BAKER has dealt at some length in his report on the plants of the expedition. The genus he has called *Enterosora* [No. 184]; the species he has been good enough to gratify me by naming after my friend the late WILLIAM HUNTER CAMPBELL, LL.D. —a man who for very many reasons but especially for his constant endeavour to forward the scientific interests of the colony, deserved so well of the people of Guiana. It is perhaps worthy of mention that this plant so closely resembles in outward appearance a fern of entirely different genus (*Polypodium trifurcatum* L. [No 184]) that I collected and dried it in mistake for that plant. Were it possible to conceive that this resemblance could be of any benefit to the genus *Entosora*, it might be supposed that its very close resemblance to *Polypodium trifurcatum* was an instance of 'mimicry.'

Above the jungle belt comes the bush belt. Here the shrubs, much fewer in number, and so scattered over the ground as to leave wide intervening spaces, appeared to me generally of much the same species as in the lower belt. Here, however, as is not the case below, they are sufficiently distributed to be individually distinguishable. Among them the most prominent are a great number of species of *Psychotria* [Nos. 83, 145, 232, 185], and a very remarkable yellow-flowered Melasma [No. 210] *M. spathaceum*, Oliv. *N. sp.*, of which Professor OLIVER writes that the specimens supplied him are too imperfect to afford means of final determination whether this should not rather be regarded as the type of a new genus outside Melasma; and, in great abundance, a *Croton* (*C. surinamense* Muell. Arg. *aff.* [No. 235]). Here too, as below, but as is not the case in the jungle belt, occur a

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large number of plants of *Brocchinia cordylinoides*, still in its small Roraima, not in its larger Kaieteur form, as well as great quantities of the huge *Stegolepis guyanensis*, Kl. [No. 338] the Iris-like plants of which being provided with a great abundance of slimy matter, made walking in parts where they grew densely most difficult. The *Brocchinia* too, grew in parts so densely that we had to walk, not on the ground but on the crowns of these plants, which, as we crushed them with our feet, poured from the axils of their leaves the remarkably abundant water which they retain—and very cold water it was—over our already cold feet. Nor must I omit to mention, though I purpose afterward to sum up my observations on the *Brocchinia* and on the various species of *Utricularia*, that in this bush belt a very few plants—I saw not more than three or four—of *Utricularia Humboldtii*, Schk. [No. 43], of the dark, Roraima form, were growing in the axils of the Brocchinia leaves, as at the Kaieteur.

Two other very interesting plants appeared to us first in this bush-belt, though we afterward found that they extended almost, if not quite up to the top of the mountain. One, Lisianthus (*L. macranthus aff.* [No 188]) was a large succulent-leaved herb, almost shrub-like, with very large, rich purple-crimson flowers centred with white—which would probably be a most valuable and gorgeous addition to our cultivated stove plants. The other was the most delicately beautiful, the most fairy-like, and at the same time for its size the most showy plant I ever saw. It was a new *Utricularia* which Professor OLIVER has kindly named also after WILLIAM HUNTER CAMPBELL. *U. Campbellianum*, Oliver, *N. sp.* [No. 187] grew among the very dwarfest mosses which

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clung to the tree trunks and boughs. The plant—that is the root and leaves—is so tiny that it was almost impossible to detect it when not in flower. The erect stem, an inch or more high, is hair-like ; and on this is borne one, sometimes two, large and brilliant red flowers somewhat of the colour and size of the flowers of *Sophronitis grandiflora.*

One more feature of the bush-belt claims notice. It is that here the tree-ferns, occurring indeed in the lower jungle-belt but there crushed out of all form and lost in the too densely-packed, struggle of plants, are here, in the greater and freer space, able to develop their true form and beauty, and so rise with stout erect stems to bear far overhead their regularly-shaped, majestic crowns of thickly growing fronds.

Next, of the rock and tree-belt all that need be said is that the same species as in the lower belt seem to occur, but that these are here for some rather obscure reason, represented by larger and more developed individuals ; that the ferns, both the tree-ferns and the more dwarf species, and one of the palms *Genoma* [No. 382], become yet more abundant ; and that the mossy universal covering which I have already dwelt on, as occurring below, here becomes so immensely dense and all-pervading—the mosses are so deep on rock and ground, hang in such dense long masses from all trees and branches—as to produce on the mind of one who penetrates into that remarkable spot a wonderful and extraordinary effect of perfect and entire stillness, as though, all things being wrapped in so dense and soft a covering, all sound, and all possibility of sound, was stilled, deadened, and annihilated.

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Just where the rock and tree belt meets the base of the cliff is a very narrow strip of quite distinct vegetation,—so distinct indeed that we might almost regard it as a distinct belt, which we might call the bramble belt.

The ground there is covered by a dense thicket of bramble bushes *Rubus guyanensis*, Focke, [No. 106], in general appearance altogether like our English blackberry bushes. Among this were large masses of the South American form, appearing very similar to our English form, of the common bracken (*Pteris aquilina*). There, too, were many little bushes of *Marcetia taxifolia* very strongly suggestive of English heath. There, too, was a flowering Laurestinus (*Viburnum glabratum*, H.B.K. No. 220) curiously like the familiar plant of our gardens. To me, after my long stay in the tropics, the whole scene suddenly seemed very home-like and pleasant. But the next minute as I turned in another direction, the illusion was dispelled by the sight of great thickets of palms (*Geonoma Appuniana*) and a few singly standing and very stately tree ferns.

Up from the bramble-belt, passing obliquely up the cliff face, ran the ledge by which we ascended to the top of Roraima. The lower part of the ledge, for perhaps two-thirds of its length, is wide, much broken and very uneven of surface. This part is somewhat irregularly bush-covered. Then the continuity of the ledge is suddenly almost broken by a deep ravine, a part of the rock having been worn away by a stream which falls on to it from the cliff above. The ravine thus made is almost bare of vegetation. Above, the ledge slopes somewhat steeply but evenly from the point where it re-commences to the top; and this part of it is cov-

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ered by a dwarf vegetation never more than two or three feet high.

The shrubs on the part of the ledge below the ravine seem to be generally much the same as on the forest slope; but among these a few new ones appear. Among the latter were the very beautiful *Drimys granatensis* Mutis [No. 242] with its very beautiful white flowers, like pendent wood-anemones; a new and beautiful Microlicia (*Microlicia bryanthoides*, Oliver, *N. sp.* [No. 239]) and several more species of *Psychotria* [Nos. 191, 291]. There, too, was an abundance of the Lisianthus [No. 188], already mentioned, and of *Utricularia Campbellianum.*

At the bottom of the ravine into which the stream falls the rocks are bare and leafless but for a large number of a pretty white flowered *Myrtus* (*M. stenophylla,* Oliver, *N. sp.* [No. 324]) which, met with no where else, were growing abundantly in the spray of the falling water.

But beyond this ravine, on the upper part of the ledge, the true botanical paradise begins. The main vegetation is formed of *Brocchinia cordylinoides,* BAKER, (in the axils of the leaves of which here grows *Utricularia Humboldtii*), *Abolboda sceptrum,* Oliver, and *Stegolepis guyanensis,* Kl. [No. 338]. But among these were wonderful numbers of plants entirely new to me and of most striking beauty. Many of these were shrubby, but of so diminutive a character as to be strictly Alpine. Of these by far the most beautiful was a wonderful heath-like plant, with dark green-leaved stems, stout and sturdy but yet seeming almost over-weighted by their great load of

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intensely vivid crimson star-like flowers. This plant [No. 308.] Professor OLIVER has identified as a *Ledothamnus* [No. 308], possibly *L. guyanensis*, Meissner, var. *minor*; but of much more slender form than is attributed to that plant in Martius Fl. Bras. VII. 172.

Another shrublet, in character recalling the "Alpine Rose" (*Rhododendron ferrugineum*) bore even more disproportionately large flowers, of an exquisite pink colour. It was a *Befaria*, approaching *B. resinosæ*, Mutis [No. 310]. Other tiny shrubs there were a white, feather-flowered Weinmannia (*W. glabra*, L. f. var?) [No. 244], a myrtle (*M.* n. sp. aff. *M. myricoidi*, H.B.K. [No. 189]) yet another species of *Psychotria*, (*P. im Thurniana*, Oliver, n. sp. [No. 163]); a *Baccharis* (*B. Vitis-Idæa*, Oliver, n. sp. [No. 241]); and a *Vaccinium* (*V. floribundum?* H.B.K. [No. 329]). On most of these tiny shrubs was growing an appropriately tiny mistletoe, (*Phoradendron Roraimæ*, Oliver, *N. sp.* [No. 323],) a miniature of our English plant. Among all these, many other interesting plants occurred. There grew, in far greater luxuriance and size than below, the pitcher plant, *Heliamphora nutans*, Benth. [No. 257]. There grew great masses of two species of Xyris (*X. Fontanisiana*, Kth. and *X. witsenoides*, Oliver, *N. sp.* [No. 240],) the latter very striking and curious by reason of the Witsenia-like habit of their dark green-leaved stems, with pretty star-like yellow flowers. There grew a plant with a flower which, because of its form and colour, I at first sight mistook for a Frittilaria, like a 'snake's head,' (*F. meleagris*); but it was a new *Lisianthus*, which Professor OLIVER has named *L. im Thurnianus*, Oliver, *N. sp.* [No. 306]. There grew many small, but

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pretty and bright-coloured orchids—a remarkable number of them new species of *Epidendrum* (*E. montigenum,* Ridley, *N. sp.* [No. 322] and another [No. 304]). And there grew a Scirpus of a new genus, named by Mr RIDLEY *Everardia* (*E. montana,* Ridley [No. 335]).

So the vegetation of the ledge continued to the top, and indeed actually over, on to the top.

The general effect of the vegetation of Roraima, fitly rivalling in this respect the marvellously strange geological aspect of the place, is so strange as to be very difficult of sufficiently emphatic description. It occupies more or less wide tracts, generally almost level, between the bare flat rocks and the groups of piled rocks which occupy the greater part of the plateau. In such places it forms a dense carpet of vegetation, which is generally but a few inches in height, except where from its general level rise a few scattered individuals of the one shrub of any conspicuous height (*Bonnetia roraimæ*, Oliver *N. sp.* [330],) —and that was never more than from 30 to 40 inches in height—or by the many and very remarkable flower-stems of *Abolboda sceptrum*, Oliver, [312], which, to my great delight, at that height bore its beautiful blooms, the appearance of which I have already described. Through this carpet of vegetation ran many small streams ; and even elsewhere much water everywhere saturated the turf. A very few plants also grew in the crevices of the piled rocks, which otherwise were bare of vegetation.

The chief constituents of this turf-like vegetation were vast quantities of a new species of *Pæpalanthus (P. Roraimæ*, Oliver, *N. sp.* [No. 294]), and great masses of sphagnum-like mosses. In the latter grew,—in such

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abundance as to redden the ground—the pretty little sundew, (*Drosera communis* [313]). Groups of very luxuriant pitcher-plants (*Heliamphora*) were there also. Great quantities of tiny shrubs of Alpine character, interwove their branches with each other and with the mosses. Among these were *Weinmannia guyanensis*, Kl. [327], *Marcetia juniperina*, D.C. [No. 319], *Psychotria concinna*, Oliver *N. sp. Baccharis* [No. 241], *Ledothamnus* [No. 308], *Befaria* [No. 310], *Vaccinium* [Nos. 329, 326], *Pernettya* [No. 333 ex parte], and *Gaultheria* [No. 332]. The small *Epidendrums*, as on the ledge, were here too, as was the tiny mistletoe (*Phoradendron* [No. 323], and the fritillary-like Lisianthus [No. 306].

A beautiful *Tofieldia* (*T. Schomburgkiana*, Oliver, *N. sp.* [297]) and, somewhat similar, *Nietneria corymbosa*, [298], with large yellow flowers were conspicuous.

In the crevices of the rocks the vegetation was different. There was a very beautiful *Utricularia* (*U. montana*, Jacq. *aff.* [No. 293],) larger and deeper in colour, but slightly less graceful than *U. Campbellianum*. And there were three species of ferns. One of these latter was a very stunted form of *Lindsaya stricta*, Dry., [No. 301], which in its ordinary form is common in many parts of Guiana. The other two were absolutely new—one a *Hymenophyllum* which Mr. Baker has named *H. dejectum*, Baker, *N. sp.* [No. 318], the other a Gymnogramme, *G. cyclophylla*, Baker, *N. sp.* [No. 295] a second species of the same group of this genus to which belongs *G. elaphoglossoides*, Baker, *N. sp.* [No. 101,215], found on the lower slopes of Roraima. Only one other species of this very distinct group is known, and has been found in the Amazon valley.

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I have now briefly noticed the most striking plants with which we met on Roraima; but before closing this paper, there are one or two points which I wish finally to set down in order.

First as to *Brocchinia cordylinoides*, Baker. This is only known to occur on the Kaieteur savannah and on Roraima, but in the latter place apparently only above a height of 5500 feet. There is, too, a remarkable difference of vigour in the habit of the plant at these two places respectively. After seeing a large number of individuals of the plant at both places it is obvious that at the Kaieteur it attains a much greater size and forms a much taller stem; and, if I may judge from the comparative abundance or scarcity of flower stalks it seems to flower much more freely at the Kaieteur than on Roraima. A possible explanation of some of these facts seems to be that the plant belongs to the kind of position and the circumstances that it finds on Roraima; that the most important of these circumstances of its existence is an atmosphere like that of Roraima or the Kaieteur, so supersaturated with damp as to effect the constant replenishment of the large quantity of water retained in the leaf-axils of the plant; and that the plant, having found its way to the Kaieteur, which though much below the proper sea-level is atmospherically so peculiarly suited for it that it has taken root there, and in its new surroundings of higher temperature has developed a new vigour. Lastly, as regards this plant, I cannot refrain from once more alluding to its possible, even probable, distribution in the other widely scattered distinct areas already enumerated.

Closely connected with the *Brocchinia* is *Utricularia*

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Humboldtii. Like the *Brocchinia* this plant grows both at the Kaieteur and on Roraima ; but at the former station it apparently *always* grows floating in the water retained in the leaf-axils of the Brocchinia, while on Roraima it grows abundantly with its roots in the ground and only very rarely in the close association with the *Brocchinia*. The Roraima plant is, moreover, far more beautiful—its flowers are of a far more intense colour—than is the Kaieteur plant. This latter circumstance is possibly greatly due to the greater vigour which the plant obtains when its roots are in the ground. I have already alluded to the occurrence of a very similar *Utricularia* on the Organ Mountains associated with a huge bromeliad just as it is at the Kaieteur with the *Brocchinia*.

Next, the two other large-flowered species of *Utricularia* from Roraima claim notice. *U. Campbellianum* has already been described. It occurs abundantly, but apparently only on the forest slope and for some distance from this up the cliff. It is new to science. The other species *U. montanæ* Jacq. *aff.* [No. 293] appears to occur only in crevices in the rocks on the summit. It is not new to science, having been previously recorded from Guiana, several of the West India islands, and other parts of Tropical America. The two species though somewhat alike in general character, are, at a second glance, evidently very distinct. *U. Campbellianum* is altogether a more delicate plant, its leaves are much smaller, rounder, and its stems are shorter ; its bladders are disc-shaped. The other species *U. montanæ* Jacq. *aff.* is altogether a stouter plant with longer-stalked, strap-shaped leaves, and with spindle-shaped bladders.

To one other set of plants I should here like to call

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attention. These are represented from among the plants collected during the Roraima expedition by two species of Epidendrum (*E. Schomburgkii,* Lindley [No. 13] and *E. elongatum,* Jacq. [No. 427]). These seem to me to be forms, from the bare, rocky ground of the interior of the country, which correspond more or less closely with three, (in a fresh state evidently very distinct,) forms, dried herbarium specimens of which have all been classed under the one name of *E. imatophyllum,* and all of which occur on trees near the coast. Of these coast forms, the most distinct is a small almost *constantly* bifloral form which occurs on trees overhanging the brackish water at the estuaries of the rivers; another, occurring on trees slightly higher up the rivers, is in general facies and colour very similar to the typical E. Schomburgkii; and the third, occurring in similar positions, but more sparingly, more nearly approaches in facies E. elongatum, but is constantly of a peculiar scarlet colour. The two last mentioned forms, unlike any of the other, are invariably associated with ants, either because these creatures prefer to make their nests in the roots of the plants, or because the seeds of the plants find their most suitable nidus, and germinate, in the ants' nest.

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List and Description of Plants.

242. Drimys granatensis, Mutis. Ledge.

40. Guatteria. In the absence of fruit may be referred to G. Ouregou, Dun. Arapoo R.

258. Heliamphora nutans, Benth. 5,400 ft. and Top.

96, 151. Sauvagesia erecta, L. forma. 5,400 ft.

309. **Leitgebia im Thurniana**, Oliv. sp. nov.—Floribus distincte pedicellatis, coronæ squamulis oblongo-spathulatis antheris æquilongis v. longioribus, Roraima: ledge and summit. *E. F. im Thurn*. Caulis plus minus ramosus pennæ corvinæ crassitie. Folia imbricata coriacea oblanceolata acutiuscula, apicem versus utrinque 2-3 crenato-denticulata, glabra, oblique nervosa ½ poll. longa: stipulæ scariosæ fimbriatæ. Flores ad apices ramulorum, ½-¾ poll. diam., pedicello ¼ poll. longo 2-3 bracteolato, bracteolis anguste linearibus stipulatis, stipulis lineari-subulatis longe ciliatis. Sepala lineari-lanceolata acuta rigidiuscula ¼ poll. longa. Petala obovata integra ¼ poll. longa. Corona basi filamentis coalita, squamulis 5 obtusis coloratis. Ovarium glabrum in stylum attenuatum.

Allied to L. guianensis, Eichl., but much more slender, with the flowers distinctly pedicellate, and the coronal squamæ equal to or overtopping the anthers.

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26. Polygala hygrophila, H. B. K. Arapoo R.

97. „ longicaulis, H. B. K. 5,400 ft.

252. „ an P. variabilis, H. B. K. var? „

79. Qualea Schomburgkiana, Warm? By Teroota.

337. **Moronobea intermedia**, Engl. sp. nov.—Ramulorum internodiis brevibus foliis crassis valde coriaceis concoloribus obovato-oblongis, in petiolum brevem canaliculatum angustatis, nervis lateralibus numerosis patentibus subtus paullum prominulis; floribus breviter pedicellatis sepalis 5 suborbicularibus cinerascentibus; petalis quam sepala arcsexico longioribus, staminum phalangibus 5-andris, superne tantum leviter spiraliter tortis petala fere æquantibus; ovario oblongo ovoideo in stylum duplo breviorem stigmate 5-fido coronatum attenuato. Roraima: *E. F. im Thurn*.

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Omnino intermedia inter Moronobeam ripariam et Moronobeam Jenmani, a priori non nisi foliis paullo majoribus et nervis minus prominulis, ab altera floribus duplos minoribus, ab utraque phalangibus androecii minus torti diversa. Engler.

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72. Marcgravia coriacea, V. ? vel umbellata L. (imperfect) Near House 5,400 ft.

11. Bonnetia sessilis Bth. Between Ireng and Cotinga R. label misplaced or missing B. paniculata, Spr. ?

330. **Bonnetia Roraimæ**, Oliv. sp. nov.—Foliis coriaceis parvis oblanceolatis v. obovato-oblongis obtusiusculis apicem versus obscure denticulatis eveniis brevissime crassiuscule petiolatis, floribus ad apices ramulorum sessilibus bracteatis, sepalis late ellipticis obtusis breviter apiculatis ciliolatis, petalis calyce longioribus cuneato-obovatis truncatis v. leviter emarginatis, filamentis apetalis liberis brevibus, basi in phalangibus 5 coalitis, antheris obovata-turbinatis emarginatis, ovario in stylum crassiusculum apice 3-fidum angustato. Summit of Roraima! *E. F. im Thurn*. Folia conferta imbricata 4-7 lin. longa. Flores ⅓-½ poll. diam.

A very distinct species of which our material is rather imperfect.

8. Mahurea exstipulata, Bth Aroie Creek.

288. Ternstrœmiacea ? (Inadequate) Path to upper Savannah.

22. Sida linifolia. Cav. Arapoo R.

130. Byrsonima crassifolia, H.B.K. var. ? nr. House.

136. Tetrapterys ? (no fruit) nr. House.

255. **Tetrapterys rhodopteron**, Oliv. sp. nov.—Ramulis appresse sericeis, foliis petiolatis obovata-v. oblanceolato-ellipticis breviter apiculatis basi cuneatis utrinque tomentello-pubescentibus supra glabrescentibus, racemis folio brevioribus sericeis, bracteis brevissimis ovatis bracteolatis medio pedicelli insertis obovatis v. late ellipticis bractea majoribus, calyce 10-glanduloso sericeo, samaræ alis lateralibus a basi divaricatis coriaceis nervosis glabris rubescentibus obtusis integris v. interdum inæqualiter dentatis. Roraima: *E. F. im Thurn*.

Folia 2½-3 poll. longa, 1⅛-1½ poll. lata; petiolus ¼-½ poll.

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longus. Bracteolæ geminatæ $\frac{1}{10}$-$\frac{1}{8}$ poll. longæ. Samara *alis longioribus* $\frac{1}{3}$ poll. longis.

211. **Revenia ruellioides**, Oliv. sp. nov.—Ramulis appresse pubescentibus foliis unifoliolatis petiolatis ovalibus utrinque attenuatis v. basi obtusis apice obtusiusculis nervo medio utrinque cum petiolo appresse pubescente, pedunculis in axillis superioribus 2 vel 1 floribus, sepalis 2 exterioribus majoribus ovatis v. oblongo-ovatis, petalis longe coalitis, tubo corollæ calyce 4-5 plo longiore leviter curvato, lobis ovatis lanceolatisve, antheris 2 fertilibus basi appendiculatis. Roraima, Upper Slope: *E. F. im Thurn.*

Folia 1¼-2½ poll. longa, 5-12 lin. lata; nervis subtus obliquis prominulis: petiolo 2-3 lin longo. Flores 1-1¼ poll. longi; corolla sericea. Calyx sepalis exterioribus ½-¾ poll. longis. Antheræ appendicibus brevibus reflexis obtusis obovatis v. truncatis.

Closely simulating some Acanthacea, with its opposite simple (unifoliolate) leaves and long curved corolla-tube sheathed at the base by the unequal sepals. The reflexed somewhat fleshy appendage at the base of the perfect anthers, has not I believe been observed in the two other described species of the genus.

15. Fruiting specimen leafless of a Pœcilandra? and flowering specimen of Gomphia guyanensis (Ouratea, Aubl)? Arapoo R.

75. Ilex Macoucoua, Pers, forma? 3,500 ft.

107, 331. Ilex retusa, Kl. 5,400 ft. and Ledge.

35, Cyrilla antillana, Michx. Arapoo R.

334. „ „ var. brevifolia. Top.

21. Rhynchosia Schomburgkii, Bth. Arapoo R.

67. **Swartzia**, sp. nov. 5,000 ft.

73. Dipteryx reticulata, Bth. ? (Type is too imperfect to be quite sure). Kookenaam R.

71. Cassia Roraimæ, Bth. Arapoo R.

39. Dimorphandra macrostachya Bth. Arapoo Valley.

106. Rubus guyanensis, Focke (ex descr.) "R. Schomburgkü, Kl." base of cliff.

244, 321. Weinmannia glabra, L.f. var.? near W. humilis, Engl, but with larger pedicels. Ledge and Top.

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327. Weinmannia guianensis, Kl. Top.

313. Drosera communis, A. St. Hil. var? Top.

324. **Myrtus stenophylla**, Oliv. sp. nov.—Ramosissima, ramulis ultimis gracilibus papilloso-scabridis, foliis patenti-recurvis anguste ovalibus v. lineari-oblongis acutiusculis basi in petiolum angustatis glabris, pedunculis folio brevioribus unifloris axillaribus recurvis apice bibracteolatis, bracteolis linearibus calycis tubo obovoideo obsolete puberulo longioribus, lobis calycis oblongo-lanceolatis obtusiusculis tubo subæqualibus petalis dimidio brevioribus, ovario 3-loculare, ovula in loculis plurima, bacca subglobosa, seminibus reniformibus. Fall on ledge of Roraima, 7,500 ft. *E. F. im Thurn.* Folia circ. ½ poll. longa, ⅜-½ lin lata; petiolus, lin. longus.

189. **Myrtus**, sp. nov. aff. M. myricoidi, H.B.K. Top and upper slope.

74. **Myrcia** (Aulomyrcia) **Roraimæ**, Oliv. sp. nov.—Ramulis teretibus pilosulo-puberulis glabrescentibus cineraceis, foliis pallidis obovato-ellipticis v. late oblanceolatis obtusis basi cuneatis subtus in nervo obsolete pilosulo, suprademum nitentibus, paniculis pedunculatis axillaribus et subterminalibus, pedunculis pauce pilosulis folio brevioribus v. subæquilongis, floribus breviter pedicellatis, pedicellis pubescentibus calycis tubo turbinate glabro sæpius brevioribus, lobis calycinis brevibus late rotundatis. Roraima 3,500 ft. *E. F. im Thurn.*

Folia 1-1½ poll. longa, ½-¾ poll. longa, vernatione supra parce pilosula; petiolus 1½-2 lin. longus. Paniculæ cymosæ 1½-2 poll. longæ.

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82. Myrcia aff. M. Kegelianæ, Berg. 3500 ft.

68. Marcetia taxifolia, D. C. (Tr.) an M. cordigera, D. C.? folia ovato basi cordata marginibus late recurvis.—5,400 ft.

174. Meissneria microlicioides, Ndn. M. cordifolia, Bth. Siphanthera (Cogn)—5,400 ft.

239. **Microlicia bryanthoides**, Oliv. sp. nov.—Fruticulosa, ut videtur fastigiatim ramosa glabra, ramulis ultimis foliiferis acuto tetragonis internodiis folio 3-6 plo. brevioribus, foliis paucis lineari-vel oblongoovalibus obtusiusculis brevissime

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petiolatis, floribus solitariis breviter pedicellatis ad apices ramulorum 5-meris, lobis calycinis ovato-lanceolatis tubo fere æquilongis persistentibus, antheris majoribus connectivo producto subæquilongis. Roraima; Ledge 6,500 feet *E. F. im Thurn*. Folia ½-¾ poll. longa, $\frac{1}{16}$ poll lata. Flores ½-¾ poll diam. Capsula calyce persistente vestita ⅛ poll longa, lobis calycis (temp. fruct.) erectis deltoideo-subulatis rigidis.

59. Pterolepis lasiophylla, Tr. (but scarcely Pterolepis ?)

20. Pleroma Tibouchinum. Tr. (Tibouchina aspera, Aubl.) Arapoo R.

319. Marcetia juniperina, D. C. Top.

89. Centronia crassiramis, Tr. 5,750 feet.

305, 216. Monochætum Bonplandii ? Ndn. Upper slope and top.

277. (Facies Miconiæ pauperulæ, Ndn. ?) Oxymeris ? aff. Oglanduliferæ, Tr. Path to Upper Savannah. Closely resembles the above Miconia; but our specimen is not good.

256. Miconia Fothergilla, Ndn. House.

223. ,, sp. (inadequate) Path.

30, 70. ,, decussata, Don. Arapoo R.

222. Meriania ? aff. M. sclerophyllæ Tr (imperfect). Forest slope 6,000 feet.

2. Cuphea gracilis, H. B. K. var. media.

4. Passiflora fœtida, L. var Konkarmo.

84. **Passiflora**, sp. E. sect. Murucuja (ut videtur). Kookenaam. R.

Folia petiolata, petiolis pollicaribus apice utroque latere glandula majuscula circulari præditis, laminis 4½-5 poll. long. 2½ poll. lat. glabris subtus glaucescentibus subcoriaceis late ovato-oblongis acutis basi rotundatis, raro arcuatim nervosis. Pedunculi . . . foliis subæquilongi apice racemosi . . . . Alabastra cylindrato-oblonga acutiuscula. Floris tubus elongatus obconicus, sepala petalaque ut videtur brevia oblonga obtusa vel rotundata. Corona faucialis e ligulis petaloideis brevibus constans, gynandrophorum gracile . . . . . .

110. **Passiflora** sp. E. sectione Astrophea ? Fruticosa cirrosa. Folia breve-petiolata petiolis sub ½ poll. long, laminis 2¼ poll. long, 1½ poll. lat. coriaceis glabris raro arcuatim

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venosis oblongis basi apiceque rotundatis . . . . Cirri simplices . . . Bracteæ . . . . Alabastra oblongai obtusa. Floris tubus brevis tubulato-campanulatus bas haud intrusus, Sepala 5-6 lin. long. oblonga obtusa navicularia extus tomentosa intus maculis linearibus purpureis, verrucisque albidis notatis. Petala sepalis conforma parum breviora tenuiora membranacea, albida maculis purpureis minimis crebris obsita. Corona faucialis biserialis; series extima e ligulis petalis æquilongis petaloideis, purpureo-maculatis dolabri-formibus, apice obliquis et in acumen longiusculum tortum prolatis; series intima e folis numerosis procedentibus dimideo brevibus, capitatellis. Corona mediana e tubo versus medium assurgens basi membranacea, apice in fila brevia divisa. Corona infra mediana e tubo versus basin emergens annularis, sub carnosa margine deflexa. Tubi facies interna, inter coronas, processibus parvis membranaceis ut videtur dense obsessa. . . . . Gynandrophorum basi ut videtur quinquangulum, angulis anguste alatis, supra medium tumidum ibique puberulum. Antheræ oblongæ obtusæ flavidæ. Ovarium ut videtur oblongum angulatum longitudinaliter costatum puberulum. Stigmata majiuscula reniformia. Our House.

141. Begonia tovarensis, Kl. var ? fructibus breviter alatis. House.
128. 5,750 feet.
162. Upper slope.

Crepinella, E. Marchal, nov. gen.—Flores hermaphroditi. Calycis margo brevis obsolete 4-dentatus. Petala 4-valvata. Stamina tot quot petala, subdico epigyno explanato superne in stylum sulcatum abeunte inserta, filamentis brevibus et antheris ovatis. Ovarium 1-loculare, 1-ovulatum, ovulo pendulo. Fructus ignotus. Frutex (?) glaber. Folia digitata. Flores in umbellas compositas terminales digesti. Bracteæ parvæ squamiformes. Pedicelli sub flore continui.

Notwithstanding the absence of fruit the genus Crepinella is very different from other Araliaceæ with 1-celled, 1-ovuled ovary differing from Eremopanax, Baillon, Cuphocarpus, Dene & Naud, and Mastixia, Blume, in its digitate leaves and umbellate tetramerous flowers. Dedicated to Mons. Crepin, Director of the Botanic Gardens, Brussels.

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162. **Crepinella gracilis**, E. Marchal. nov. sp. Foliis 5-natis petioli sulcato basi abrupte dilatato, foliolis breviter petiolulatis, ovato-elliptices, apice obtusis vel marginatis, basi acutiusculis, margine integerrimis sinu revolutis, pergamaceis, costa infra prominente, umbellulis longiuscule pedunculatis, 8-12 floris, pedunculo gracili profunde sulcato superne incrassato; floribus minutis pedicello basi bracteolato 4-poll brevioribus, calycis tubo obconico, 8 sulcato, corolla hemisphærica acutiuscula sulcata, petalis ellipticis, apice leviter incrassatis incurvis, nervia tenui extus impressa notatis• stylo gracili, latitudinem disci vix æquante fructu.—Roraima: *E. F. im Thurn.*

Rami supremi graciles. Petiolus communis circ. 5 cm. longus. Petioluli 6-10 mill longi. Foliola 4-5 cm. longa atque 3 cm. lata. Pedicelli 5-7 mill. longi.

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128. **Sciadophyllum coriaceum**, E. Marchal. nov. sp. —Inflorescentiis foliisque subtus tomento adpresso subferrugineo demum hinc inde deterso vestitis, foliis digitatis, 5-7-natis, foliolis ellipticis, apice rotundatis v. sæpius leviter emarginatis, basi acutiusculis margine integerrimis anguste revolutis crassiusculis, coriaceis, supra denudatis, reticulo nervorum densiusculo infra valde prominente, floribus in umbellas duas composi-tas superpositasque digestis, umbellulis numerosis, 9-12 floris, pedunculo compresso elongato superne dilatato, radiis filiformibus basi bracteolatis, calycis limbo minute 5 dentato, corolla hemisphærica acutiuscula, petalis apice cohærentibus demum a basi secedentibus staminum filamentis brevibus, stylis in unum sulcatum 5 fidum latitudinem disci epigyni vix æquantem concretis fructum. Roraima: *E. F. im Thurn.*

Allied to Sciadophyllum japurense Mart. et Zuce, but differing in leaves inflorescence and style. Arbor. Rami supremi 2 cm. crassi, petiolus communis 20 cm. longi. Petioli 24 cm. longi. Foliola 11-13 cm. longa atque 4-5 cm. lata. Pedicelli 5-8 mill. longi.

220. Viburnum glabratum, H.B.K. base of cliff.

134. Coccocypselum canescens W. var House.

6. Kotchubæa (Synisvon Schomburgkianum Baill) Aroie Creek.

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69. Declieuxia chiococcoides, H.B.K. House.
29. Sipanea pratensis, Aubl Arapoo R.
135. Cephaëlis axillaris, ? Sw. House: Upper slope.
83. Peychotria inundata, Bth. ? 3,500 feet.
145. „ crassa, Bth. ? House.
232. „ „ Upper slope.
185. Psychotria sp. (=Schomburgk 1018 B, and Appun, 1103). Upper slope.

163, 320. **Psychotria im Thurniana**, Oliv. sp. nov.—Glaberrima; ramulis gracilibus internodiis rectis subteretibus foliis sub-sessilibus anguste vel lineari-lanceolatis acuminatis basi obtusissimis subcordatisve, costa prominula, nervis secundariis utrinque circ. 10-15 incurvis prominulis nervo marginali attingentibus cum venulis intermediis, stipulis basi connatis deltoideo-subulatis brevibus, cymis terminalibus pedunculatis 9-15 floris laxiusculis bracteis obsoletis, calycis limbo 4-dentato, dentibus deltoideis corollæ tubo cylindrico limbo 2-plo longiore. Roraima. Upper Slope and Ledge, 7,000 feet. *E. F. im Thurn.* Folia tenuiter coriacea flavescentia 1¾-2¼ poll. longa, ¼-⅜ poll. lata. Flores 2-2½ lin. longa; corollæ limbus 2-2½ lim. diam., lobis ovatis obtusis tubo intus piloso. Ovarium biloculare.

191, 214. Psychotria sp. (Imperfect). Upper Slope and Our Path.
291. „ ? sp. Path to Upper Savannah.

Psychotria concinna, Oliv. sp. nov.—Glaberrima, ramulis gracilibus atropurpureis, foliis petiolatis parvis coriaceis ovalibus acutis v. acutiusculis supra costa subprominula nervis lateralibus obsoletis, subtus costa prominente nervis secundariis utroque latere 7-10 prominulis patentim curvatis nervo marginali attingentibus, stipulis liberis (utrinque geminatis) e basi crassiuscula erectis subulatis rigidiusculis, floribus in cymis pauci-floris parvis breviter pedunculatis terminalibus dispositis, pedicellis brevissimis, calycis lobis minutis ovatis, corollæ tubo recto gracili glabro intus medium versus pilosulo superne leviter dilatato, lobis brevibus ovatis. Roraima: Ledge 6,500 feet and summit. *E. F. im Thurn.* No. missing. Folia 7-12 lin longa, ¼-⅜ poll lata: petiolus 1-1½ lin. longa Cymæ 5-8 floræ. Corolla 6-7 lin. longa (lobi 1 lin.)

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66. Palicourea riparia? Bth. forma angustifolia.
85. ,, rigida, Kth.
90. Relbunium (Schombk 646/984 B.) 5,400 ft.
23. Eupatorium amygdalinum, D. C. Arapoo R.
Eupatorium sp.? not identified. No label.
95. Eupatorium conyzoides, V. var. 5,400 ft.
91. Mikania pannosa, Baker 5,400 ft.
16. Pectis elongata, H. B. K. Wai-ireng R.

241, 325. **Baccharis Vitis-Idæa,** Oliv. sp. nov.—Ramulis ultimis puberulis foliis crebris tenuiter coriaceis oblanceolatis obtusis apice 1-3-5-mucronatis, in petiolum basi cuneatim angustatis glabris, capitulis companulato-hemisphæricis 15-20-floris in corymbis terminalibus sæpius sessilibus dispositis, involucri bracteis pauciseriatis, interioribus (in cap ♀) scariosis anguste lineari-oblongis deciduis, pappo albido. Roraima, Ledge, 7,300 ft. and summit. *E. F. im Thurn.*

Folia ½-1 poll. longa, 3-4½ lin. lata, capitula ½-¾ poll. diam.; bracteis exterioribus ovatis v. ovato-lanceolatis plusminus scariosis margine apicem versus sæpe denticulatis v. minuto-fimbriatis (in invol ♂ ut videtur obtusioribus) achænia lineam longa angulata glabrata; pappus achænio longior, setis circ. 30 minute barbellatis.

328. Baccharis aff. B. cassiniæfoliæ, D. C. an var?
63. Achyrocline flaccida D. C. 4,000 ft.
250. Gnaphalium spicatum Lam. 5,400 ft.
86. Verbesina guianensis, Baker 5,400 ft.

27. **Calea ternifolia,** Oliv. sp. nov.—Suffrutex scaber, foliis ternatis ellipticis v. ovato- v. obovato-lanceolatis breviter petiolatis late acutatis utrinque apicem versus 1-3-dentatis supra scabris subtus præcipue in costa nervisque setulosis, capitulis circ. 20-floris homogamis pedunculatis ad apices ramulorum umbellatim dispositis, involucri squamis exterioribus herbaceis ovatis v. ovato-oblongis capitula brevioribus, squamis interioribus rigidiusculis late oblongis obtusis striatis, paleis concavis obtusis superne leviter dilatatis, ovariis parce setulosis paleis pappi acuminato-subulatis brevioribus. Arapoo River. *E. F. im Thurn.* Folia rigida ¾-1½ poll. longa, 5-8 lin. lata; petiolus ad 1 lin. longus. Umbellæ 3-5 cephalæ, pedunculis hispidulis capitulis sæpe

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paullo longioribus. Capitula late campanulata ½ poll longa atque lata.

247. Erechthites hieraciifolia, Raf. 5,400 ft.

10. Stifftia condensata, Baker. Nr. Waetipoo M.

314, 346. Centropogon lævigatus, A.D.C. var ? Ledge 5,400 ft.

77. ,, surinamensis. Presl. ? 3,500 ft.

56. Psammisia ? sp. (inadequate) 5,400 ft.

49. Psammisia, with glabrous smooth purple brown stem, ovate-oblong shortly apiculate quintuplinerved leaves of 4 to 6 ins. and contracted umbelliform racemes of flowers 1 in. in length on pedicels of ½-¾ in. This is probably Schomburgk's No. 670/974 of which corollas are wanting in our example. Whether it be Klotzsch's *P. guyanensis* I cannot say. Roraima upper slope. *E. F. im Thurn.* Under the same numoer is apparently another Psammisia, in early bud, with more broadly elliptical leaves and acute calyx segments.

109. Notopora Schomburgkii Hook. f. 5,400 ft.

243. Sophoclesia aff. S. subscandenti (ovario glabro) Ledge 7,300 ft.

329, 333. Vaccinium an V. floribundum, H.B.K. ? (V. polystachyum ? Bth.) Top and Ledge.

326, 365. Vaccinium an V. floribundum, H.B.K. var. ? Top.

308. **Ledothamnus guyanensis,** Meissner in Mart. Fl. Bras vii, 172 var minor; foliis minoribus imbricatis acutis ciliolatis, floribus sessilibus v. subsessilibus, filamentis anthera 3-5 poll longioribus. Roraima: Upper part of ledge and summit. *E. F. im Thurn.*

Possibly a distinct species, but as our Schomburgk specimens are more advanced and scarcely in a comparable state, better left as above for the present. The leaves are only about 2½ lines long (in the type 4 lines). minutely setulose ciliolate, Flowers 1 to 1¼ in. in diameter, of vivid crimson. In our type the flowers are on pedicels, of ¼ to 1 in., but these may perhaps elongate after flowering.

Befaria guianensis, Kl. Label missing.

310. Befaria aff. B. resinosæ, Mutis (sepalis obtusioribus) 2 forms Top.

With No. 333 Pernettya nr. P. parvifolia Bth. and allies (in fruit.)

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103. Gaultheria cordifolia, H.B.K. 5,400 ft.
332. ,, aff. G. vestitæ. Bth. pedicellis longioribus. Top.
137. Lucuma rigida, Mart. and Eichl. (nr. House.) 5,400 ft.
108. Grammadenia lineata Bth. 5,400 ft.
36. Ditassa taxifolia, Dene. Arapoo R.
155. **Vincetoxicum** (Orthosia) **hirtellum**, Oliv. sp. nov.—Volubile, caule gracili pilis brevibus subpatentibus hirto, foliis ovali-oblongis rigidiuscule apiculatis, marginibus revolutis, supra hirtellis in sicco rugulosis, subtus præcipue in costa pilis patentibus hirtis, cymis sessilibus v. brevissime pedunculatis pauci v. plurifloris folio brevioribus, floribus subsessilibus v. pedicello calyce vix longiore, corollæ lobus angustus intus hirsutus, coronæ segmentis 5 basi in annulo brevissimo continuo insertis lineari-lanceolatis gynostegium fere æquantibus, stigmate obtuso. Roraima: *E. F. im Thurn.*

Folia ¾-¾ poll longa; petiolis $\frac{1}{12}$ poll longus v. brevior Flores ⅛ poll. longi. Very much resembles in general facies *Ditassa pauciflora.*

147. Nephradenia linearis, Bth??
113. Curtia (Schuebleria tenuifolia Don) 5,400 ft.
47. Lisianthus amænus Miq. 5,400 ft.
306. **Lisianthus im Thurnianus**, Oliv. sp. nov.—Gracilis glaberrimus, caule inferne folioso teretiusculo internodiis folio brevioribus utrinque lineis elevatis duabus notatis, foliis coriaceis obovatis ellipticisve obtusis v. obtusciusculis margine anguste revolutis triplinervus, pedunculo elongato cymis 3-2-floris, floribus longe pedunculatis calyce (¼-½ poll. longo) 5-fido lobis ovato lanceolatis acutiusculis, corollæ (2-poll.) tubo leviter dilatato limbi lobis oblongeovatis acutis, filamentis elongatis gracilibus glabris inclusis, antheris oblongo, ellipsoideis inappendiculatis. Roraima: Ledge and Summit, *E. F. im Thurn.* Caulis 1-pedalis erectus v. basi decumbens. Folia ¾-¾ poll. longa basi in petiolum angustata, ½-½ poll. lata. Pedunculus communis 3-6 poll. longus; bracteæ superiores lineares v. ovales: Discus hypogynus o.

In our specimens the limb of the corolla looks as though it might remain straight or even slightly incurved in flower.

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188. Lissianthus aff. L. macrantho sed calycis lobis acuminatis corollæ tubum æquantibus. Upper Slope.

3, Heliotropium aff. H. fruticoso conf. H. strictissimum = Schombk 185 & 283/576 Konkarmo.

24. Solanum an S. Convolvulus ? Sendn. (Inadequate). Arapoo R.

210. **Melasma ? spathaceum,** Oliv. sp. nov.—Scabrum foliis suboppositis v. inferioribus alternis brevissime petiolatis ovato ellipticis basi rotundatis v. leviter cordatis dentatis supra scabris, floribus pedunculatis in axillis superioribus pedunculis folio subæquilongis apice bibracteolatis, bracteolis linearibus, v. oblanceolatis basi angustatis, calyce alabastro acuminato florifero antice fisso spathaceo, corolla exserta leviter incurva tubo, superne leviter dilatato limbi brevis lobis subæqualibus lobo, postico truncato emarginato, lateralibus obtusissimis, antico obovato rotundato bifido. Roraima: Upper Slope, *E. F. im Thurn.* Ramula retrorsum hispiduli. Folia (exsicc. nigrescentia) ¾-1¼ poll. longa, 4-7 lin. lata. Calyx 5 nervius, alabastro, oblongo-ellipsoideus apice acuminatus, parce præcipue in nervis, scabridus, 10-12 lin. longus. Corolla 1¼ poll. longa, Stamina inclusa didynama; filamenta glabra; antheræ sagittatæ glabræ dorsifixæ loculis æqualibus basi apiculatis. Ovarium glabrum.

I have had too imperfect material to determine finally if this plant should be left in Melasma or regarded as the type of a new genus. There are no ripe fruits and I should like to be more confident about the form of the corolla lobes and their æstivation.

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129. Beyrichia ocymoides, Cham. circ 5,400 ft.

43. Utricularia Humboldtii, Schombk. 5,400 ft.

187. **Utricularia** (S. Orchidioides) **Campbellianum,** Oliv. sp. nov. scapo gracili (1½-2½ pollicari) uniflora sæpius squamis linearibus v. lineari-lanceolatis remotis bracteiformibus instructo foliis tenuibus obovatis obtusis basi in petiolum angustatis, bracteis ternis ovatis v, oblongo, ellipticis pedicello brevioribus v. æquilongis, calycis lobis ovato-cordatis obtusis, corollæ labio superiore brevi calycem vix superante, labio inferiore amplo rotundato integro, calcari gracili

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cylindrico acutato incurvo labium corollæ æquante. Roraima: *Schomburgk;* Upper slope, *E. F. im Thurn.*

Folia cum petiola ½ poll. longa, lamina ½-¾ poll. lata. Calyx lobis 4-5 lin. longis latisque. Corolla labio inferiore 1 poll. lato.

293. Utricularia aff. montanæ, Jacq. (U. unifloræ R. & P.) Top.
78. „ an tenuifolia, Benj. 3,500 ft.
287. Gesneracea? In fruit only. Path to upper Savannah.
64. **Tabebuia Roraimæ**, Oliv. sp. nov.—Ramulis ultimis puberulo vel scabrido-lepidotis, foliis trifoliolatis foliolis oblongo-ellipticis obtusis sæpe mucronulatis lateralibus breviter petiolulatis, supra glabrata sutbus cano-lepidotis nervis conspicuis depresso areolatis, racemis terminalibus pauci v. plurifloris, bracteis lineari-spathulatis scaebrulis pedicellis erectis bibracteolatis; calyce infundibuliforme lepidoto-puberulo lobis breviter ovato rotundatis, corrollæ tubo calyce triplo longiore infundibuliformi limbi lobis patulis late rotundatis. Roraima: 5,000 ft. *E. F. im Thurn.*

Folia petiolata; petiolus (in ramulis floriferis) 1-1½ poll. longus; foliola 2-3½ poll. longa, 10-16 lin. lata; petiolulus centr. ½-¾ poll. longus. Flores 3½-4 poll. longi, limbo 2½-3 poll. lato.

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14. Aphelandra pulcherrima? Kth. v. Artetragona Nees. Ireng R.
81. Justicia sp. = Appun No. 1,387 (in part); Kookenaam Valley.
52. Lippia Schomburgkiana, Schr.
1. Stachytarpheta mutabilis V. Konkarmo.
38. Hyptis arborea, Bth. Arapoo R.
249, 98. Hyptis lantanæfolia Poit. 5,400 ft.
111. Coccoloba Schomburgkii, Meiss 5,400 ft.
139. Peperomia not identified; material scarcely adequate. 5,400 ft.
140. „ an P. tenella Dietr.? 5,400 ft.
196. „ „ „ ? Upper Slope.
224. „ reflexa, Dietr. „ „
219, 236. Hedyosmum brasiliense, Mt.? „ „
323. **Phoradendron Roraimæ**, Oliv., sp. nov.—Flavescens, ramulis teretibus infra nodos interdum compressis crassitie pennæ corvinæ parce hirtellis foliis lineari-oblongis v. anguste ovalibus acutiusculis, floribus monoecis, spicis

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1-articulatis 5-7 floris, baccis ellipsoideis lævibus? carnosis. Roraima: Ledge and summit, *E. F. im Thurn*,

Folia carnosula moderate coriacea parce pilosula v. glabrata basi in petiolum brevem angustata, 5-9 lin. longa, 1-2 lin. lata: internodia ½-1 poll. longa. Spicæ axillares solitarieæ apiculatæ 1-2 lin. longæ; vagina bracteoli leviter bidentata v. subtruncata, lateraliter compressa.

Mr. im Thurn's No. 276 (Roraima, path to upper Savannah) may be a glabrate form of this plant with rather broader obtuse obscurely mucronulate leaves.

142. Phyllanthus pycnophyllus, Muell. Arg. 5,400 ft.
235. Croton aff. C. surinamensi, Muell Arg. Forest belt.
76. Sponia micrantha, Sw. 3,500 ft.
58. Burmannia bicolor, Mart. 4,000 ft.
121. Dictyostegia orobanchoides, Miers. Upper slope.
280. Pleurothallis stenopetala, Lindley. Upper slope Roraima,
183. Stelis grandiflora, Lindley, „ „ „
285. Stelis tristyla, Lindley. „ „ „
127. Lepanthes (inadequate) 5,400 ft. (Our House)
275. Octomeria ? sp. Upper slope
289. Microstylis umbellalata ? Sw.
279. Masdevallea picturata, Reichenbach fil. Upper slope
286. „ brevis, Reichenbach fil. „ „
57. Bulbophyllum Geraense, Reichenbach fil. 5,400 ft. (Our House)
290. Elleanthus furfuraceus, Reich. fil. Upper slope
274. Epidendrum tigrinum, Lindley. Upper slope
13. „ Schomburgkii, Lindley. Ireng River
42. „ elongatum, Jacquin, 5,400 ft. (Our House)

296. **Epidendrum alsum**, Ridley, n. sp. (§ Euepidendra planiculata.)– Caulis validus, ¼ uncia crassus ramosus; folia coriacea brevia ovata obtusa, 1¼ ad ¾ uncia longa ¾ lata. Vaginæ rugosæ vix uncia longæ. Panicula abrupte deflexa, ramis duobus flexuosis 1 ad 2½ uncia longis. Flores parvi carinosi, 8 in ramo, dissiti. Bracteae ovatæ cucullatae subobtusæ, Sepala lanceolata carinata petala angusta lanceolata quam sepala dimidio breviora, et paullo tenuiora, Labellum cymbiforme ovatum cordatum carnosum. Columna brevis. Top of Roraima. The affinity of this plant is with E. frigidum, Lind.

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299. **Epidendrum im Thurnii**, Ridley, n. sp.—Caulis gracilis teres parum ramosus ultra runcialis. Folia angusta linearilanceolata coriacea carinata, uncia longa, ⅛ lata, vaginis rugosis. Racemi, 2 vel 3, deflexi vix uncia longi sex flori. Flores parvi tenues. Bracteæ ovatæ, pedicelli ⅓ æquantes. Pedicelli ½ unciales. Sepala lanceolata oblonga obtusa curva, circiter ⅓ uncia longa. Petala linearia angusta uninervia. Labellum ovatum cordatum cymbiforme, basi angustatum. Columna gracilis paullo recurva. Anthera pileata subcornica obtusa capsula fusiformis. Top of Roraima.

322. **Epidendrum montigena**, Ridley, n. sp.—Caulis teres gracilis, ultra semipedalis. Folia elliptica lanceolata mucroniata carinata, uncia longa ⅛ lata; vaginae ¼ uncialis rugosae. Racemi deflexi multiflori, haud ramosi circiter 3 uncias longi. Flores parvi tenues. Bracteæ ovatæ subacutæ patentes, Sepala lanceolata ovata falcata ¼ uncia longa. Petala angustiora lanceolata. Labellum cymbiforme lata cordatum, carnosum. Ledge and top,

51. Epidendrum durum Lindley. Our House

300. **Epidendrum violascens**, Ridley, n. sp.—Caulis semipedalis gracilis foliis distichis lectus, Folia brevia brevia lanceolata crassiuscula recurva, ¼ uncia longa; vaginis superiorum violaceis. Panicula erecta gracilis 5 uncialis, ramis paucis tenuibus. Flores pauci perparvi. Bracteae lanceolatae breves recurvæ. Sepalum posticum lanceolatum obtusum trinervium, lateralia basi connata et ad basin labellum adnata lanceolata obliqua apicibus excurvis, trinervia. Petala linearia angusta uninervia, Labellum rotundatum subreniforme, marginibus serrulatiss costae tres elevatae versus apices attenuatæ, columna crassiniscula. Top of Roraima.

304. Epidendrum, sp. 7,500 Ledge.

80. Cattleya Lawrenceana. Reichenbach fil. C. pumila, Schomburgk, "Reise Brit. Guian." p. 1,068 non. Hooker. Roraima.

55. Cyrtopodium parviflorum, Lindley. Roraima 4,000 ft.

50. Zygopetalum Burkei, Reichenbach fil. Our House

61. Koellensteinia Kellneriana, Reichenbach fil. Roraima 4,000 ft.

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360. **Aganisia alba,** Ridley, n. sp.—Pseudobulbus nullus. Folia 2-volata lanceolata acuta, basi attenuata sub-coriacea, costis tribus elevatis in dorso, 7 uncias longa, ½ lata, scapus lateralis erectus, 13 uncias longus, vaginis 2-3 apice obtusis amplexis, remotis paullo ampliatis. Racemus laxus, 10-florus. Flores, mediocres, uncia longa et lata. Bracteae Pedicellis multo breviores ovatæ acutæ inferiores vaginantes. Pedicelli ½ uncia longi. Sepala ovata lanceolata subacuta. Petala subsimilia obtusiora et angustiora. Labellum integrum, mentum plicatum, lamina rhomboides obtusa lata. Columna brevis crassiuscula, alis magnis obtusis falcatulis apicibus curvis. Anthera subconica. Stigma semilunare. Kookenaam River 3,000 ft.

This plant is most nearly allied to A. cyanea, Benth (Warrea cyanea, Lindl.). There is a figure of what seems to be the same species in the drawings made by Schomburgk preserved in the British Museum. It was obtained at Takootoo, and is represented with white flowers, with the base of the lip and the mentum yellow, a few faint purple stains towards the apex of the lip and purple streaks on the face of the column. The fruit deflexed, oblong in shape. It is found also in the region of the Kaieteur Fall.

114. Oncidium nigratum, Lindley 5,400 ft. Our House.

12. **Oncidium orthostates,** Ridley, n. sp.—(Pluriturberculata Homœantha expansa). Pseudo bulbus oblongus 2 uncias longus. Folium lanceolatum oblongum 3 uncias longum uncia latum. Scapus elatus validulus rigidus ultra bipedalis. Bracteæ lanceolatæ deflexæ breves ¼ uncia. Flores mediocres, iis O. coesii æquantes. Pedicelli ½ uncia longi. Sepala lanceolata subacuta, petala subsimilia viridia brunneo-m aculata (ex sicco). Labelli lobi laterales spathulati obtusi, medius basi angustatus rotundatus reniformis emarginatus, cuspide minuta. Calli carina lamellas duas breves gerens. Columna brevis lobis obtusis magnis dolabriformibus tenuibus. Pedicellus pollincorum elongatus ligulatus discus oblongus quadratus margine exteriore croceus. Ireng River No. 12, im Thurn; 23 Savannah, W. H. Campbell. sp. indeterminanda, Upper Slope Roraima.

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148. Catasetum cristatum? Monachanthus form. Our House.
115. Pogonia parviflora, Reichenbach fil. 5,400 ft. Our House.
19. Sobralia stenophylla, Lindley. Spelinicola. Arapoo River.
273. Sobralia, sp. indeterminable. Upper Slope, Roraima.
342. **Spiranthes bifida**, Ridley, n. sp. Tubera elongata clavata.

Folia ovata petiolata acuta tenuia parva, lamina semiuncia longa ¼ uncia lata, petiolus vix semiuncialis. Caulis debilis parce pubescens, ferme 10 uncialis, vaginis circiter 9 laxis lanceolatis acuminatis dissitis, ⅜ uncia longis. Racemus densus spiralis, uncia longus. Bracteæ flores superantes, lanceolatæ acuminatæ. Sepala, petala et labellum subsimilia, lanceolata angusta obtusa, marginibus involutis apice bifida, minute papillosa. Petala quam sepala angustiora. Columna brevis, anthera erecta obtuse acuta, ovarium minute pubescens. Our House, Roraima.

131. Stenoptera viscosa Reichenbach fil. Our House, 5,400 ft.
173. **Stenoptera adnata**, Ridley, n. sp.—Tubera plura lanata elongata. Folia tenuia membranacea lanceolata acuta 3 uncias longa. ½ lata. Caulis validulus 17 uncialis supra pubescens. Vaginis pluribus dissitis lanceolatis acuminatis usque ad basin fissis, longissima 1½ uncialis. Racemus multiflorus densus pubescens. Flores parvi reversi. Bracteæ lanceolatæ acutæ ⅜ unciales floribus æquantes. Ovarium breve crassiusculum pubescens; Galea (sepalum posticum petala adnata) ovata cucullata obtusa, marginibus fimbriatis. Sepala lateralia oblonga ovata acuta. Labellum ovatum lanceolatum, lobis lateralibus tenuibus erectis vixdistinctis, medio lingui-formi, carnoso, obtuso, supra canaliculato, basi subtus pubescente. Columna elongata gracilis apice clavata, parte inferiore pubescente. Upper slope.

9. **Pelexia aphylla**, Ridley, n. sp.—Tubera desunt, folia radicalia nulla, caulina lanceolata acuminata 6 dissita, superiora latiora, Caulis 8 uncialis pubescens proesertim versus basin. Flores pauci mediocres, albi, sepalum posticum ad petala adnatum, galeam efformans, lanceolatam acuminatam cucullatam, petala quam sepalum breviora. Sepala lateralia lanceola linearia porrecta marginibus involutis,

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Labellum cuneatum spathulatum obtusum minute pubescens, subemarginatum labulo obscuro in medio; calcar ad ovarium arcte adnatum. Columna brevissima, rostellum prolongatum. oblongum obtusum canaliculatum porrectum. Anthera lanceolata obtusa vix biloculata. Pollinia pyriformia bicrura discus ovalis rotundatus. Waitipoo Mountain.

251. Habenaria parviflora. Lindley. (Our House, 5,400 ft.)

367. **Habenaria Moritzii**, Ridley, n. sp. Caulis semipedalis ad pedalis foliatus. Folia erecta lanceolata acuta dissita, maxima 2 uncias longa ¼ longa ¼ lata, Racemus laxus circiter 15-florus Bracteæ lanceolatæ acuminatæ. Flores parvi. Sepalum posticum erectum, lateralia deflexa, ovata lanceolata mucronata. Petala bifida, lacinia postica erecta anguste linearia-lanceolata quam sepalum posticum paullo brevior anguste linearis obtusa recurva. Labellum trilobum lobi laterales filiformes quam medius longiores et angustiores. Calcar lineari clavatum ¼ uncia longum. Columna majuscula. Anthera obtusa, apices breves, recti, lobi stigmatici crassiusculi obtusi breves.

At 4,000 feet Roraima. No. 630b. Moritz. Venezula

53. Selenipedium Lindleyanum Reichenbach fil. (Our House 5,400 feet) Roraima and S. Klotscheanum Reichenbach fil. Cotinga River.

315 or 311 (2 labels) Tillandsia stricta, var. ?

316. Tillandsia, sp. ? (Inadequate).

45. Puya (probably new). (Inadequate).

366. Cipura paludosa, Aubl.

28. Sisyrinchium alatum, HK.

298. Nietneria corymbosa, Kl. and Schk. Top.

297. **Tofieldia Schomburgkiana**, Oliv sp. nov. Foliis elongato-linearibus longe acuminatis minutissime ciliolatis longitudinaliter striatis basi distiche vaginantibus, scapo erecto tereti glabro foliis longioribus, floribus strictis racemosis pedicello erecto subæquilongis, calyculi bracteolis ovatis acutis perianthio 6-plo brevioribus, segmentis perianthii erectis oblongis acutis valide 5-7-striatis Roraima, 6,000 ft., *Schomburgk;* Summit. *E. F. im Thurn.*

Folia 3-12 poll. longa, ½-¼ poll. lata. Scapus ½-2 ped. longus, 5-9- (3-x) florus Flores flavido-virentes semi

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pollicares; perianthii segmenta temp. florif. acutata persistentia rigida. Bracteæ ovato lanceolatæ appressæ.

Nearly allied to T. falcata, W. (T. frigida H.B.K.) from which it differs in its strict inflorescence of longer pedicels flowers.

Schomburgk describes the leaves as margined with red.

257. Xyris Fontanesiana, Kth. 5,400 feet.

62. **Xyris setigera,** Oliv. sp. nov. Subacaulis foliis linearibus setoso acuminatis marginibus minutissime setuloso scabridis scapo foliis 4-5 plo longiore stricto gracillimo subtereti glabro capitulo ovoideo paucifloro bracteis coriaceis obtusis ovatis v. ovato ellipticis staminodiis ad faucem corollæ insertis bipartitis pencillatis, antheris filamento libero longioribus. Roraima, 4,000 feet. *E. F. im Thurn.*

Folia 1-2 poll. longa, $\frac{1}{24}$-$\frac{1}{20}$ poll. lata. Scapi 5-7 poll. longi 1 v. 2 ex una radice; vagina carinata angusta foliis pusillo longior. Bracteæ interiores cymbiformes oblongo elliptica obtusæ v. marginatæ ¼ poll. longæ. Sepalia lateralia linearia complicata anguste carinata, carina obsolete denticulata.

240. **Xyris witsenioides,** Oliv., n. sp. Caulescens caule decumbenti subscapo sæpius dichotomo, foliis rigidis distiche arcte inbricatis linearibus longitudinaliter striatis glabris ad apicem acutissimum gradatim angustatis, basi vaginante scariosa spadicea, scapo gracili foliis 3-5 plo longiore capitulis paucifloris bracteis glabris obtusis v. interioribus majoribus emarginatis, sepalis lateralibus incurvis rigidis carinatis carina scabriuscula, staminodiis flabellatim dilatatis longe penicellata-plumosis, ovario apice rostrato rostro persistente. Roraima: Ledge, 7,300 feet. *E. F. im Thurn.*

Folia 2½ poll. longa 1 lin. lata leviter falcatim incurva. Scapus in dichotomiis solitarius compressiusculus v. subangulatus, 6-9 poll. longus; vagina foliis brevior. Capitula ½ poll. longa bracteis haud arcte imbricatis.

Singular in the Witsenia-like habit of its stout stems, in our specimens 3-4 ins (ranging to 6-8 ins. *E. F. im Thurn.*) in length, lateral branches being given off immediately under the solitary scapes.

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312. **Abolboda sceptrum**, Oliv.; n. sp. Foliis lineari-lanceolatis acutis rigidis læte viridibus leviter glaucescentibus, scapo crassitie pennæ anserinæ, floribus capitalis, capitulis floriferis 4-5 poll. diam. bracteis ovatis acutis rigidis sepalis ½-⅔ brevioribus, sepalis ovato-lanceolatis subæquilongis lateralibus carinatis, petalis limbo ovato flabellatim venoso ovario ovoideo stylo longo basi appendicibus 3 crassiniusculis arcte uncinatis ovario æquilongis circumdato, ovula plurima. Roraima, Summit. *E. F. im Thurn.*

Folia 6-7 poll. longa. Bracteæ ovatæ v. interiores ovato-lanceolatæ ⅔-1½ poll. longæ. Sepala 1½-1¾ poll. longa. Petala 2-2½ poll. longæ, inferne in tubum leviter curvatum ovalita. Stamina petalis breviora; filamenta anguste linearia; antheræ lineares. Ovarium cartilagineum ¼ poll. longam; stylus 1¾ poll. longus.

The leaves I have not seen, Mr. im Thurn having kindly supplied me with a note of their size and form. He describes the foliage as "Yucca-like". Our specimen consists of a well-developed capitulum and 8-9 ins of its scape. The flowers hardly admit of being satisfactorily analysed. They are very much larger than in other species seen by me, and the tube of the united petals much wider. The singular uncinate appendages are inserted with the style upon the ovary, not as in some species at a distinct interval above it.

338. Stegolepis guianensis, Kl. 6,000 ft.

34. Eriocaulon Humboldtii, Kth. ? (= specimen from Roraima, Schomburgk) Arapoo River

33. Pæpalanthus, Schomburgkii, Kl. Arapoo River

60. ,, flavescens, Kth. (eriocephalus Kl.) 4,000 feet.

294. **Pæpalanthus Roraimæ**, Oliv. sp. nov. Acaulis foliis dense rosulatis brevibus rigidis linearibus obtusiusculis basi latioribus leviter falcatis rectisve, basi arcte imbricata lanuginosa excepta glabra longitudinaliter striata, scapo solitario vaginato, vagina foliis subduplo longiore spathacea v. bifida glabra involucri bracteis linearia lanceolatis glabratis v. parce pilosis fuliginosus, bracteis disci flores stipantibus oblanceolatis v. obovato-cuneatis cymbiformibus. Roraima summit: *E. F. im Thurn.*

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Folia ¾-1 poll. longa. Scapus glabrescens v apicem versus obsolete puberulus 3½-4½ poll. longus. Capitula hemisphærica ¼ poll. diam. Flores breviter pedicellati. Perianthium segmentis exterioribus liberis obovatis concavis apicem versus coloratis interioribus staminigeris subæquilongis. Ovarium triquetrum.

269. **Anthurium roraimense**, N. E. Brown, sp. nov. Cataphyllis magnis lanceolatis, petiolis teretibus elongatis, lamina cordata subacuminata lobis posticis semioblongis quam antico subtriplo brevioribus sinu parabolico sejunctis, nervis primariis 13, venis primariis costa utrinque 6-7, omnibus supra subtus prominentibus; pedunculo valido tereti; spatha oblongo-lanceolata, filiformi-acuminata; spadice stipitato, spatha subæquante valido.

Hab. Roraima British Guiana, *E. F. im Thurn*.

Cataphylla minora 3 poll. longa, majora 7-8 poll. longa, 1-1¼ poll. lata, pergamentacea reticulato, venosa, nervi, intramarginali margine valde approximato Spatha 5½ poll. longa, 1¾ poll. lata. Spadix, cum stipite ½ poll. longa, 5 poll. longus ½ poll. crassus. Flores, 1 lin. diam. stylo conico brevissime exserto.

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382. Geonoma Appuniana, Spr.

358. Euterpe 5,400 ft.

259. Fimbristylis hispidata Kunth (Our House 5,400 ft.) Roraima.

245. Rhynchospora glauca Vahl. (Our House) 5,400 ft.

253. „ capillacea Torrey (Our House).

„ leptostachya Boeckla 5,400 ft.

248. Scleria hirtella Swartz.

209. „ bracteata.

357. Cryptangium stellatum Boeck. Upper Slope Roraima. The male plant of this species does not seem to have been hitherto met with or described, I therefore add a description of it.

Panicula longissima, rami graciles. Spiculae plures, binæ castaneæ, ¼ uncia longæ. Bractea lanceolata longe mucronata trinervia, mucro ciliata. Glumæ vacuæ 8 floriferæ 2. Stamina tria apiculis longis acuminatis, dimidio antheras æquantibus.

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Everardia, Ridley, nov. gen. (Cryptangiearum.) Herbea perennis. Caulevalido descendente lignoso. Folia conferta rigida recurva. Culmus paniculatus validus lateralis, escanilla folii inferioris oriens? Panicula laxa, rami plurimi inferiores masculi, supremi feminei, Spiculæ masculæ pluriflorae, glumis 3 vacuis 6 floriferis. Stamina tria, femineæ parvæ, glumis 4 vacuis. 1 florifera. Stylus brevis, stigma bifidum lobis brevis planis lanceolatis. Ovarium tri-angulatum breviter pedicellatum, cupula nulla. Sætæ hypogynæ copiosæ tortæ.

335. **E. montano**, Ridley, n. sp. Caulis brevis. vaginis latis decompositis superne tectus. Folia lineari-lanceolata acuta acuminata carinata recurva marginibus albociliatis, longissima 1 uncia longa, ½ uncia lata. Culmus 14 uncias longus validus, compressus, anceps pro maxima parte paniculata, efoliata, vaginis paucis brunneis fissis, compressis sæpius lamina parva lanceolata obtusa rigida. Spiculæ masculæ singulæ, ⅜ uncias longæ copiosæ castaneæ, inferiores pedunculatæ, Glumæ 3 vacuæ staminiferæ 6 lanceolatæ aristatæ. Marginibus parce ciliatis, arista brevis crassiuscula. Stamina in flore 3. Anthera acuminata filamento æqualis, ¼ uncia longa. Apiculus brevis simus processuum fasciculo terminali brevi. Spiculæ femineæ parvæ angustae. Glumæ vacuæ 4, una fertilis, exteriores cartilagineæ lanceolatæ brevi aristætæ, castaneæ interiores scariosæ, carina violacea. Stylus stigmate æqualis, teres crassiusculus brevis. Stigma breviter bifidum, lobis lanceolatis obtusis planis, violaceis, ovarium ellipticum oblongum obtuse triquetrum breviter pedicellatum, pedicello subtereti. Setæ hypogynæ cæpiosæ totæ. Pistillum ¼ unciale; caryopsis ferme ⅛ uncia longa.

Ledge, Roraima. This genus is most nearly allied to Lagenocarpus but differs entirely from that genus and from the rest of the Cryptangieæ in the lateral inflorescence, the bifid stigma with short flat lobes, the absence of any cupule and the presence of a long number of hypogynous bristles.

262. Paspalum stellatum. Flugge. var.? . 5,400 ft.

261. Panicum nervosum Lam.? ,,

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254.	Arundinella brasiliensis, Raddi	5,400 ft
154.	Echinolæna scabra. H.B.K.	,,
246.	Saccharum (Eriochrysis) cayennensis P. de B.	,,
260.	Ischæmum latifolium, Kth.	,,
359.	? Guadua (barren)	,,
18.	? Chusquea (,,)	Arapook.
302.	Gram. dub (,,)	Top.

The following is a complete list of the ferns collected. The numbers are Mr. im Thurn's collecting numbers. Those enclosed within brackets indicate the position of the species in the sequence followed in our Synopsis Filicum. In determining the species I have had the kind help of Mr. Jenman, the Government Botanist of the colony, who is now in England, and who has paid special attention to ferns ever since he has lived in Demerara.

The summit of the mountain is 8,600 feet and the encampment of the party was pitched at 5,700 feet above sea-level. J. G. Baker.

343. Gleichenia pubescens, H.B.K. var. G. longipinnata, Hook. Upper slopes of the mountain.

92. Cyathea vestita, Mart. In the neighbourhood of the encampment.

270. Alsophila bipinnatifida, Baker, with a slender caudex six or seven feet in length. In the neighbourhood of the encampment.

87. (16*) **Alsophila macrosora**, Baker, n. sp. Stipitibus basi paleis linearibus brunneis imbricatis dense vestitis, frondibus amplis deltoideis bipinnatifidis crassiusculis proeter venas primarias faciei superioris glabris, pinnis oblongo-lanceolatis, pinnulis lanceolatis inferioribus distincte petiolatis basi truncatis ad costam alatam pinnatifidis segmentis tertiariis oblongis crenulatis venis simplicibus erecto-patentibus 5-6—jugis, soris magnis globosis superficialibus intramarginalibus, receptaculis dense paraphysatis.

Basal paleæ extending 4-5 inches up the stipe, glossy moderately firm in texture, the largest ½ inch long. Stipe a foot long, brownish, deeply grooved down the face. Lower pinnæ 15-18 inches long, 8-9 inches broad. Lower pinnules 4 inches long, ⅔ inch broad, with a petiole ⅛ inch long,

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which is articulated at the base. Tertiary segments ½ inch broad. Allied to the Bahian A. præcincta, from which it differs by its more coriaceous texture, crowded sori and densely paraphysate receptacle.

37. Alsophila villosa, Presl.

318. (16*) **Hymenophyllum dejectum,** Baker, n. sp. Stipitibus productis paleis pallidis ascendentibus lanceolatis præditis, frondibus oblongo-lanceolatis bipinnatifidis erectis glabris, pinnis lanceolatis confertis decurvatis pinnulis superioribus simplicibus inferioribus profunde pinnatifidis, segmentis ultimis linearibus integris uninervatis, soris breviter pedicellatis ad basin segmentorum ultimorum impositis, involucro campanulato valvis argute serratis.

Rootstock not seen, Stipes 2-3 in. long, clothed with minute inconspicuous pale membranous paleæ, as is also the rachis. Lamina 4-5 in. long, ¾ in. broad. Pinnæ decurved, not more than ½-¾ in. long. Final segments $\frac{1}{12}$-⅛ in. long, not more than ⅛ line broad. Involucre ⅓ line broad. A very distinct novelty, allied to H. demissum and H. javinicum.

118, 199, 374, Hymenophyllum polyanthos, Sw., upper slope of the mountain.

207, 302, 370, 372, 373, Hymenophyllum microcarpum Hook. Upper slope of the mountain. This is evidently not more than a variety of H. polyanthos.

205. Hymenophyllum crispum, H.B.K. Upper slope of the mountain.

203, 375. Hymenophyllum lineare, Sw. Upper slope of the mountain : (200) var. antillense, Jenman.

292. Hymenophyllum fucoides, Sw. Upper slope of the mountain.

271. Trichomanes macilentum, V.D.B. Upper slopes of the mountain. Will have, I think, to be regarded as not more than a variety of T. Bancroftii, Hooker.

198, 201, 349, Trichomanes pyxidiferum, L. Upper slope of the mountain. 349 represents the variety T. cavifolium, C. M.

99, 347. Trichomanes crispum, Sw. The higher number from the upper slopes of the mountain, the lower from the neighbourhood of the encampment.

119. Trichomanes rigidum, Sw. Neighbourhood of the encampment.

120. Davallia Imrayana, Hook. Upper slopes of the mountain.

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344. Lindsaya guianensis, Dryand. Upper slopes of the mountain.

149, 150, 30. Lindsaya stricta, Dryand. The two lower numbers gathered near the encampment, the other on the mountain top.

161, 303. Hypolepis repens, Presl. Base of the cliff, 194, 195 are young forms of Hypolepis most likely the same species.

144. Pteris lomariacea, Kunze. Neighbourhood of the encampment.

160. Pteris incisa, Thunb. Base of the cliff.

156. Lomaria Plumierii. Desv. Upper slope of the mountain.

88, 167. Lomaria procera. Spreng. Upper slope of the mountain and in the neighbourhood of the encampment.

48. Lomaria Boryana, Willd. Neighbourhood of the encampment.

157, 369. Asplenium lunulatum, Sw. var, A. erectum, Bory. Base of the cliff.

171. Asplenium rhizophorum, L. var. A. flabellatum Kunze. Upper slope of the mounatin.

143. Asplenium furcatum. Thumb. Neighbourhood of the encampment.

272. Aspidium capense, Willd. Path to the upper savannah.

275. (4*) **Nephrodium (Lastrea) brachypodum,** Baker, n. sp. Caudice erecto, stipitibus brevissimis cæspitosis pilosis, frondibus parvis lanceolatis firmulis subglabris simpliciter pinnatis e medio ad basin et apicem sensim attenuatis, rachi piloso paleis paucis patulis lanceolatis prædito, pinnis sessilibus lanceolatis basi utrinque auriculatis centralibus profunde serratis reliquis integris infinis deltoideis, venis superioribus pinnarum simplicibus erecto-patentibus, inferioribus furcatis vel parce pinnatis, soris superficialibus medialibus, involucro membranaceo, subpersistente.

Frond 5-6 in. long, an inch broad, narrowed very gradually from the middle to both ends. Lower pinnæ not more than ½ in. long. Stipes not above half an inch long. Central pinnæ ⅛ in broad above the dilated base. Upper slope of the mountain. May be an involucrate form of the well-known West Indian Polypodium hastæfolium Sw., which it resembles very closely in size, shape, texture and venation.

94, 380. Nephrodium conterminum, Desv. Upper slopes of the mountain and neighbourhood of the encampment.

269. Nephrodium Leprieurii, Hook. Neighbourhood of the encampment.

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126, 169, 225. Nephrodium denticulatum, Hook. Upper slopes of the mountain and neighbourhood of the encampment.

354. Nephrodium amplissimum, Hook. Upper slopes of the mountain.

102, 339. Nephrolepis cordifolia, Presl. Neighbourhood of the encampment.

356 (13*). **Polypodium (Phegopteris) demeraranum**, Baker, n. sp. Caudice erecto, stipite producto pubescente basi paleis paucis lanceolatis brunneis membranaceis prædito, frondibus oblongo-lanceolatis bipinnatifidis præsertim ad venas pilosis pinnis sessilibus lanceolatis ad costam alatam pinnatifidis inferioribus reductis infimis remotis perparvis, pinnulis oblongo-lanceolatis integris obtusis, venulis simplicibus 8-9-jugis pilosis, soris superficialibus parvis supramedialibus.

Stipites 6-8 in long below the much dwarfed lowest pair of pinnæ, grey and pubescent, as is the rachis. Largest basal paleæ half an inch long. Lamina 1½-2 ft. long, 7-8 in. broad at the middle. Largest pinnæ 4-4½ in. long, about an inch broad. Pinnules above ⅛ in. broad. Closely allied to the Himalayan B. auriculatum, Wall., in size, texture, and cutting, but quite different in the position of the sori. Found on the upper slopes of the mountain. Gathered previously by Appun, 1138.

168 (15*). **Polypodium (Phegopteris), roraimense**, Bakeri n. sp., Caudice erecto, stipite producto glabro stamineo, frondibus oblongo-lanceolatis bipinnatis praeter costas facie, superioris glabris, pinnis sessilibus lanceolatis simpliciter pinnatis inferioribus reductis infimis remotis perparvis, pinnulis oblongo-lanceolatis subintegris obtusis, venulis 7-8 jugis ascendentibus simplicibus, soris globosis superficialibus supramedialibus.

Stipes 3-4 in. long below the dwarfed lowest pinnæ. Lamina 1⅛ ft. long, 8-9 in. broad at the middle. Largest pinnæ 4-4½ in. long, about an inch broad. Pinnules ⅛ in. broad. Closely allied to the preceding and to the West Indian P. germanianum and ctenoides. Gathered upon the upper slopes of the mountain.

177, 182, 282, 307, 345, 352, 376. Polypodium marginellum, Sw., Upper slopes of the mountain in the crevices of the rocks.

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184. (ex parte) Polypodium trifurcatum, L. Upper slope of the mountain, mixed with Enterosora Campbellii.

166, 350, 368, 377. Polypodium furcatum, Mett, Summit and upper slope of the mountain.

133. Polypodium serrulatum, Mett. The type in the neighbourhood of the encampment and No. 351 var Xiphopteris Jamesoni, Hook, on the upper slopes of the mountain.

178. Polypodium trichomanoides, Sw. Upper slope of the mountain.

348. Polypodium truncicola, Klotzsch. Upper slope of the mountain. New to Guiana.

181. Polypodium moniliforme, Lag. Upper slope of the mountain var. P. saxicolum, Baker.

179. Polypodium tovarense, Klotzsch. Upper slopes of the mountain.

186. (159*) **Polypodium (Eupolypodium) Kalbreyeri,** Baker, n. sp., Rhizomate breviter repente paleis parvis patulis linearibus brunneis, frondibus deltoideis simpliciter pinnatis coriaceis glabris rachi nudo castaneo, pinnis linearibus adnatis contiguis integris superioribus sensim minoribus, venis immersis occultis furcatis, soris globosis superficialibus latitudinem totam pinnarum inter costam et marginem occupantibus.

Stipes 8-10 in. long, naked or furnished towards the base with minute squarrose soft hair-like paleæ. Rachis castaneous, like the stipe. Lamina 5-6 in. long, 3-3½ in. broad at the base. Pinnæ about 20 on a side below the caudate apex of the frond, ⅓ in. broad at the base, narrowed gradually to an acute, point. Sori a line in diameter, 12-16 jugate on the lower pinnæ. Nearest the Andine P. melanopus, Hook and Grev, from which it differs by its stiffly erect stipes, frond broadest at the base, and obscure immersed veins. Found on the upper slopes of the mountain and gathered previously by Kalbreyer on the mountains of the province of Ocana in New Granada at an elevation of 6,500 ft. above sea-level.

186 (ex parte) **Polypodium (Eupolypodium) kookenamæ,** Jenman, sp. nov., Caudice crasso, breviter repente v. suberecto, paleis castaneis subulatis ciliatis dense vestito. Stipitibus paucis, contiguis, suberectis rigidiusculis, subferrugineis,

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obscure ciliatis. Frondibus arcuatim procumbentibus, oblongo-lanceolatis, basi truncatis, subcoriaceis, glabris, supra atrovirescentibus, subtus pallescentibus, incise pinnatifidis. Segmentis utrinque 16-20-jugis superioribus in apicem subintegrum acuminatum gradatim decrescentibus, integerrimis acutis, ad basin brevissime decurrentem paululum connexis sinu acuto. Costis mediis in parenchymate celatis. Rachi haud immerso, utrinque subfusco, furfuraceo. Venis 1-furcatis. Soris medianis, copiosis, rotundis, leviter depressis, ad apices anteriorum venlarum impositis. Upper slope of Roraima.

Stipites 7-9 in. l. erect, wiry. Fronds 6-8 in. l. 2 in. w. Segments ¾-1 in. l, linear-oblong, barely ¼ in. w. at the base, and not much narrowed outwards till the acute point is reached. Dark green above, pale metallic-green beneath. Intermediate between, P. melanopus, Hook and Grev. and P. bruneo-veride, Baker. Resembling the latter exactly in colour, but the fronds relatively broader and shorter. Occurred in set C. of the collection by mistake for P. Kalbreyeri, Baker.

180, 379. Polypodium taxifolium, Linn. Upper slope of the mountain.

104. Polypodium pectinatum, Linn. In the neighbourhood of the encampment.

124. Polypodium cultratum, Willd. In the neighbourhood of the encampment.

217. Polypodium zanthotrichium, Klotzsch (P. elliptico-sorum, Fee) Upper slopes of the mountain. Appears to be distinct specifically from P. cultratum by its uniformly elliptical sori.

281. Polypodium rigescens, Bory. Upper slope of the mountain.

176. Polypodium firmum. Klotzsch. Upper slope of the mountain.

378. Polypodium subsessile, Baker. Upper slope of the mountain.

190. Polypodium capillare, Desv., Upper slope of the mountain.

125 (212*) **Polypodium (Eupolypodium) melanotrichium** n. sp. Caudice erecto paleis subulatis crispatis vestito, stipite brevissimo gracillimo, frondibus oblongo-lanceolatis parvis flaccidis membranaceis glabris bipinnatifidis, pinnis lanceolatis adnatis, profunde pectinato-pinnatifidis inferioribus sensim minoribus, segmentis deltoideis acutis venis brevibus

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simplicibus erecto-patentibus, soris globosis superficialibus cortularibus ad apicem venarum impositis.

Stipes and rachis black, thread-like, glabrous, Lamina 3-4 in. long, an inch broad at the middle, Central pinnæ half an inch long, ⅛ in. broad, with 6-8 pairs of deltoid segments with a single sorus in the centre of each, Allied to the Brasilian P. achilleæfolium Kaulf, but quite different in texture, in the shape of the segments and by its very short simple veins. Found in the neighbourhood of the encampment.

172. Polypodium (Goniophlepium) loriceum, Linn. Base of the great cliff.

340. Polypodium (Phlebodium) aureum, Linn, var, P. areolatum, H.B.K. In the neighbourhood of the encampment.

208. Polypodium (Camyploneuron) angustifolium, Sw. var. P. amphostemon, Kunze. In the neighbourhood of the encampment.

295. (14*) **Gymnogramme (Pterozonium) cyclophylla,** n. sp. Caudice erecto, stipitibus cæspitosis elongatis erectis basi primum paleis minutis linearisubulatis patulis præditis, frondibus parvis nitidis rigide coriaceis apice rotundatis margine recurvato basi cuneatis margine plano, venis flabellatis immersis, soris oblongis ad venarum apicem solum productis cite confluentibus zonam angustam intramarginalem formantibus.

Stipes wiry 5-6 in. long. Lamina only about an inch long and broad. Found on the summit of the mountain.

101, 215 (14*) **Gymnogramme (Pterozonium) elaphoglossoides,** n. sp. Caudice valido lignoso paleis parvis subulatis nigro-castaneis dense vestito, stipitibus elongatis erectis nudis castaneis frondibus simplicibus integris rigide coriaceis nudis elliptico-lanceolatis acutis vel obtusis conspicue costatis basi cordatis, venis confertis, patulis parallelis simplicibus vel furcatis intra marginem evanescentibus, soris linearibus cite confluentibus frondis faciem totam inferiorem præter zonam angustam marginalem occupantibus.

Stipes wiry sometimes above half a foot long. Fronds 6-8 in. long; fertile 1-2 inches, sterile sometimes 3 inches broad. Sori occupying the whole under surface except a

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marginal border not more than $\frac{1}{8}$-$\frac{1}{12}$ in. broad. Found both upon the upper slopes of the mountain and in the neighbourhood of the encampment.

These two interesting novelties both fall under the genus. Pterozonium of Feé, figured at tab. 16 of his Genera Filicum. The only species known previously is the very rare Gymnogramme reniformis, Mart., figured Icon Crypt. Bras. tab. 26 and also in Hooker's 2nd Century of Ferns tab. 9 and on tab 49 of the Fern volume of Flora Brasiliensis. The two new species are very distinct both from one another and G. reniformis. In G. cyclophylla the sori form a narrow band just within the margin ; in G. reniformis a broad semicircle a distinct space within the margin ; whilst in G. elaphoglossoides they cover the whole surface except a narrow border.

194. Gymnogramme Schomburgkiana, Kunze, Upper slopes of the mountain.

197. Gymnogramme hirta, Desv. Upper slope of the mountain New to Guiana.

150. Gymnogramme flexuosa, Desv., Upper slope of Roraima, also new to Guiana.

Enterosora, Baker, genus novum. Sori oblongi vel oblongo-cylindrici exindusiati ad venas decurrentes intra frondis laminam orti, demum ad frondis faciem inferiorem rimis angustis obliquis imperfecte obvii, venæ pinnatæ, venulis paucis ascendentibus prope frondis marginem anastomosantibus et areolas steriles hexagonas sori unico centrali includentes formantibus.

Most resembles Gymnogramme, from which it differs mainly by having the sori immersed within the tissue of the frond and only appearing very partially on the lower surface even in a mature stage.

184 (ex parte) **Enterosora Campbellii**, Baker, n. sp. The only species. Upper slopes of the mountains, with Polypodium trifurcatum. Rootstock cylindrical, suberect, densely clothed with small brown membranous lanceolate paleæ. Stipes slender, brown, erect, wiry, 4-5 in. long, with a few very inconspicuous spreading fibrillose paleæ downwards. Lamina oblanceolate simple, subcoriaceous, glabrous, 6-8 in. long,

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under an inch broad, obtuse, narrowed gradually to the base, conspicuously repand on the margin with broad rounded lobes, veins very distinct when the frond is held up to the light, arranged in pinnate groups, one opposite each lobe, the sterile veinlets forming unequal hexagonal areolæ, with a single vein bearing a sorus in the centre of each. Sori ⅛-¼ in. long, 4-6 to each of the central pinnated groups, erecto-patent as regards the whole lamina, seen partially at last on the lower surface by slits that seem as if they were made with a knife through the epidermis.

Frond in shape and texture much resembling that of Polypodium trifurcatum, from which it differs by its long stipes and totally different veining in addition to the entirely dissimilar shape and position of its sori. In naming it after the late W. H. Campbell Esq., I am carrying out the wish of Mr. im Thurn.

170. Vittaria lineata, Sw. Upper slopes of the mountain.

212, 218. Vittaria stipitata, Kunze. Upper slope of the mountain. New to Guiana.

229, 231. Acrostichum latifolium, Sw. Upper slopes of the mountain. Two different varieties, both rigid in texture, narrowed very gradually from the middle to the base, and 229 dotted over the under side with minute subpeltate brown paleæ.

233, 238. Acrostichum Lingua, Raddi.

267. Acrostichum stenopteris, Klotzch. In the neighbourhood of the encampment. New to Guiana.

266. Acrostichum decoratum, Kunze. In the neighbourhood of the encampment.

278. Acrostichum Aubertii, Desv. var. **crinitum**, nov. var. Recedes from the Brazilian and Columbian type of the species towards A. villosum by its much more crinite lamina both in the sterile and fertile frond, and by the stipes being clothed with squarrose subulate brown paleæ, as in the Venezuelan A Reichenbachii, Moritz. Path to the upper slope. The species is new to Guiana.

237 (45*) **Acrostichum (Elaphoglossum) leptophlebium**, Baker, n. sp. Rhizomate repente cylindrico lignoso paleis parvis membranaceis lanceolatis brunneis crispatis dense vestito, stipite

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elongato stramineo subnudo, fronde sterili lanceolato membranaceo glabro paleis paucis lanceolatis ad marginem et faciem inferiorem prædito, venis laxis perspicuis erecto-patentibus simplicibus vel furcatis intra marginem terminantibus, fronde sterili multo minori stipite longiori.

Sterile lamina a foot or more long, 18-20 lines broad, cuneate at the base, with a slender fragile stipe, 4-5 inches long. Fertile lamina 4-5 inches long, an inch broad, with a stipe about a foot long. Found upon the upper slope of the mountain.

93. Acrostichum muscosum, Sw., var. A Engelii, Karst. In the neighbourhood of the encampment.

213. Acrostichum squamosum, Sw. Upper slope of the mountain.

41. Acrostichum (Rhipidopteris) peltatum. Sw. In the neighbourhood of the encampment.

100. Schizæa dichotoma, Sw. In the neighbourhood of the encampment, new to Guiana.

85. Schizæa elegans Sw. In the neighbourhood of the encampment.

263. Anemia tomentosa, Sw. In the neighbourhood of the encampment.

146. Lycopodium alopecuroides, L. In the neighbourhood of the encampment.

192. Lycopodium linifolum L var. sarmentosum rubescens, Spring. Upper slopes of the mountain.

230. Lycopodium subulatum, Desv. Base of the cliff.

226. (159*) **Selaginella (Stachygynandrum) vernicosa,** Baker, n. sp. Caule basi decumbente superne recto laxe pinnato, ramulis paucis brevibus ascendentibus, foliis heteromorphis distichis crassis firmis nitide viridibus, planæ inferioris confertis erecto-patentibus ovatis obtusis margine ubique denticulatis, planæ superioris duplo brevioribus ascendentibus ovatis obtusis valde imbricatis, spicis tetragonis brevissimis bracteis conformibus magnis ovatis acutis.

This belongs to the Atrovirides group in the neighbourhood of S. Martensii. The main stems are about half a foot long, the leafy branches an eighth of an inch broad and the leaves of the lower plane a line long. The type as described was found at the base of the cliff, and a variety (No. 381)

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with much fewer, more elongated branches, near the encampment.

122. (186*) **Selaginella (Stachygynandrum) roraimensis,** Baker, n. sp., Caule erecto 3-4 pinnato, ramis laxe dispositis ascendentibus ramulis brevibus, foliis heteromorphis distichis membranaceis planæ inferioris laxis oblongo-lanceolatis acutis valde inæquilateralibus basi superiori producto late rotundato, planæ superioris ovatis ascendentibus cuspidatis. spicis tetragonis, bracteis conformibus ovatis acutis valde imbricatis acute carinatis sporangiis duplo longioribus,

Belongs to the Radiatæ group in the neighbourhood of S. radiata and confusa. The main stems are 4 or 5 inches long; the leafy branches $\frac{1}{8}$ in. broad and the leaves of the lower plane a line long. Found in the neighbourhood of the encampment.

(271*). **Selanginella (Heterostachys) rhodostachya,** Baker, n. sp., Caule decumbente ramis alternis deltoideis flabellato-pipinnatis, foliis heteromorphis distichis membranaceis, planæ inferioris laxe dispositis, erecto-patentibus ovatis obtusis paulo inæquilateralibus superioris consimilibus duplo minoribus valde ascendentibus, spicis brevissimis platystachyoideis, bracteis dimorphis ovatis acutis membranaceis.

Belongs to the group Prontiflore in the neighbourhood of S. consimilis and ottonis. The stems are half a foot in length and the leafy branches $\frac{1}{8}$ in. broad. This was contained in the collection without any number.

768. Hookeria (Omaliadelphus) crispa, G. Mull. Bot. Zeit 1855.

123. Imperfectly fruited. Near encampment.

51. Hypopterygium tamariscei, Sw. (Hypnum). Hew. Musci.

265. Frond without fruit, near encampment.

620. Polytrichum aristiflorum Mitt. Zl. Linn. soc. xii.

116. A few barren stems, near encampment. Creeping over the roots of this are a few stems of Gungermannia perfoliata, Swartz, or of one of the closely allied S. American species of the little group to which Mr. Spruce has applied the name Syzygiella in the Journal of Botany 1876, intending it to include Jungermannia perfoliata J. contigua and J. concreta, Grtesche J. plagiochiloides and J. pectniformis, Spruce, also J. macrocalyx Mont. To these must be added

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J. geminifolia Mitt. Zl Linn. Soc. vii. 164 from tropical Africa and the J. subintegerrima, Reinev. Bb. et Nees Hep. Jav. in the Synopsis Hepaticarum, placed in Plagiochila (p.55) to this belong P. variegata Lind. P. variabilis Lacoste and also P. securifolia, Lind. Sp. Hep. t x. all which have the leaf angles united on both sides of the stem even when they are not opposite, a characteristic which is not mentioned in their original descriptions or depicted in their figures nor in that of the J. macrocalyx as found in the Synopsis. The perianth in J. subintegerrima agrees with that found in the species allied to J. colorata and as in their case is subtended by shortened and dentate involucral leaves.

Exactly similar instances of the conjugation of the leaf-angles are found in Plagichila, some of which do not otherwise resemble each other.

283. Plagiochila adiantoides, Sw. Lind. Male stems only Upper Slope.

204, 284. Aneura bipinnata Sw. (Jungermannia) Specimens taken from large tufts. Upper Slopes.

In these specimens the stems are 4-5 c.m tall including the side branches, 1 c.m wide, the ultimate ramuli with a limb of about two rows of more pellucid cells. In A. fucoides Hook. Musi Exot, t. 85, this limb is very much wider; in A. Poepgregiana it is nearly or quite obsolete. Besides these, there are several other remarkable S. American species. A. balata, Gotts., from Chili, a very large species. A. prehensilis Hook, f. et Tayl. Fl. Ant. originally from Hermite Island, since collected by Cunningham with stems nearly six inches tall and always with its pruinose look when dry, A. polyclada Mitt, gathered in Otway Harbour, Patagonia, during the visit of the Challenger expedition, a small species about one and a half inches tall.

A. polyptera Mitt. from Magellan, collected in Cockle Cove by Dr. Coppinger H.M.S. Alert, fronds 10 c.m. alt, 2 c.m. lat, ramis approximatis tripinnatis ubique lamina 5-6 cell lata limbulus dorso planus, laevis ventre precipue in ramis ramulisque lamellis angustis longitudinalibus vestitus, and A. denticulata Mitt, from the Andes of Bogota gathered

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amongst mosses by Weir-frons 5-6 c.m altus cum ramulis 1 c.m. latus ramis remotiusculis bipinnatis ubique limbo pellucidiore cell. 4 lato margine denticulatis divaricatis angustis subciliatis. All these species shew that in S. America there is a development of larger forms than are yet known elsewhere.

Blipharozia Roraimae, Mitt. n. sp. folia erecto-patentia imbricata cochleariformi concava integerrima lobulata obtusa; involucralia conformia, prianthera (abortiva) cylindracea abrupte obtusissima ore parvo rotundo. From the top of Roraima; one stem only.

Entire plant of a dark red brown colour, about 4 c m. tall; it is divided below into two, one being again forked, the leaves are imbricated in bifarious order and are repeatedly in interrupted series, each innovation arises from towards one side of the dorsal base of the perianth with small leaves which increase rapidly in size upwards, the largest being the involucral; here the greatest diameter is about 4 m.m. long, and of these as many as four are observable on the undivided stem; and as each innovation arises from the same position they stand at the side of the stem rather towards the neutral ride. In all particulars they closely resemble the abortive perianths seen on B. sphagnoides and other species; the young innovation also is in close similarity to that of the male amenta of that species, but there is no trace of the lobule, which is not, as has been supposed, distinct from the leaf in B. cochleariformis, but is seen from being an almost closed one in some species to be opened out in B. evoluta.

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History of the Origin, Customs, Religion, Wars, and travels of the Caribs, Savages of the Antilles in America.

Written by Father De La Borde, employed with the Reverend Father Simon, Jesuit, to convert the Caribs. (Translated from the French, and condensed, by G. J. A. Bosch-Reitz.)

[*Introductory Note.*—The narrative by PERE DE LA BORDE which here follows is the first of a series of reprints of the literature of West Indian and Guiana Redmen which it is proposed to publish from time to time in *Timehri*. The present example has been kindly translated for the purpose by Mr. BOSCH-REITZ. It is a delightfully naive and truthful picture of a very early view of that particular form of Carib life which was lived in the West Indian islands before Europeans had taken complete possession of those places. There is little, indeed no, doubt that the extinct Caribs of the islands and the existing Caribs of Guiana were merely localized branches of one and the same race. Almost everything that LA BORDE tells of the Caribs in the islands may be seen in Guiana at the present day. Our author seems, however, to have had to do with Caribs of quite unusually dirty and immoral habits. Nor can there be much doubt that he misread the superstitious notions of these people; but then this particular misreading of these so-called savages has been made by almost all missionaries, as a consequence of the naturally prejudiced views with which they approached the study. ED.]

THERE are so many different histories of the islands that it is quite unnecessary to repeat what has so often been said of them. If, however, it may seem that I do so, it is where matters have been inaccurately represented or in some way misrepresented to us. I shall not speak here of the air, climate, and the nature of the country; others have spoken enough about these. I shall only offer some remarks, for the sake of those interested in such matters, on the customs and superstitions of the savages; and I guarantee all I say of them to be true, having had to deal with them personally, and paid great attention

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to their customs. An enquiry of this nature is praiseworthy in so far as one derives some benefit from it; because, when I consider that the Caribs are hospitable, without ambition, very simple, without greediness, very sincere, without fraud, without blasphemy, without lies, I cannot but admire them, and imitate them in the above points; but if they have their perfections they also have their vices, of which later. When I consider their blindness and that they have neither belief, law, nor king, I feel obliged to render thanks to my Creator for giving me the knowledge of a God, and for causing me to be born in the true religion, and a subject of the greatest king on earth.

Of the Origin of the Caribs. I will not try to discover the origin and descent of the Caribs, the island savages of America, as they themselves know nothing about it, They care as little about the past as about the future; and writers give such different accounts about the matter that I can discover nothing certain on this point. Some have thought that they are descended from the Jews because they practise circumcision, and also because they eat no pork. Old savages have told me that they are descended from the Galibis of the mainland (neighbours to the Arawaks, their enemies) whom they closely resemble in language, customs and religion; and that they had entirely destroyed a certain nation on the islands with the exception of the women, whom they took to themselves, which is the cause why the language of the men differs in some respects from that of the women. I also believe that the cause of difference between them is due to the fact that the Caribs have consorted with strangers and so changed their customs and

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manners. Some however of them do not change; and these tell the others that the cause of their misfortune, sickness, and of the war carried on against them by Christians, arises from their no longer living after the manner of Caribs.

Of their Religion and their idea of the Creation of the World and the Heavens. Though they are of very fickle character, and are very flighty and inconstant in all their undertakings, yet in matters of religion they, after the manner of heretics, are obstinately attached to their *Chemeens* and all their other superstitions, and nothing one can tell them to prove to them that they are being deceived by the devil, is able to convince them; like the Calvinists, they have no priest, altar, or sacrifices. This is peculiar to them, I think, alone of all heathens. By their brutal passions, barbarous customs, and bestial lives, they have smothered all such knowledge and light as Nature gives them of the Divinity. I would not believe this myself were it not that I see it every day, and though they have been preached to for the last twenty years they will not believe, nor will they recognise their Creator, the source of all good. They fear the Devil, whom they call MABOIA; but they render him no worship. Judging from their fables, we have reason to believe that the light of the Evangelists must have been revealed to them formerly. LOUQUO was the first man and a Carib. He was not made of any other body; he descended from the sky and lived a long time on earth. He had a large nostril, from which, as also from an incision in his thighs, he produced the first men. A great many things took place during his life

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which are unfit to be related here. He made fishes out of scrapings and fragments of cassava, which he threw into the water: he rose again three days after death and returned to the sky: the animals came after him, but the Caribs know not whence.

The Caribs were formerly long-lived, and even if they did not get old they died without illness. They ate nothing but fish, which is always young and never gets old.

Later, they found a small field of cassava which LOUQUO had left behind him; but, not knowing this plant, an old woman appeared and taught them the use of it, and told them that by breaking the wood in small pieces and planting these in the earth more roots would come. They say that in the beginning the cassava only took three months to mature; that afterwards it took six, and at last nine, as at present, before it was fit to be made into bread, which they call *Aleba,* and the women *Marou.*

They believe that the sky has always existed, but not the earth and seas, and that these have not always been in the same good order in which they are at present.

Their first man, LOUQUO in the beginning made the earth soft and smooth, without mountains: they cannot say from where he got the substance. The Moon followed immediately, and esteemed herself very pretty, but after seeing the sun she went and hid herself from shame, and has never shown herself but in the night. All the heavenly bodies are Caribs. They make the Moon masculine, and call her NONUN and the Sun, HUOIOU. They attribute the eclipses to MABOIA, the devil, who tries to kill them. They say that this wicked seducer

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cuts their hair by surprise and makes them drink the blood of a child, and, that, when they are totally eclipsed, it is because the Stars being no longer warmed by the Sun's rays and light, are very ill. They respect the Moon more than the Sun, and as soon as the new Moon appears they all run out of their huts and cry, *Look at the moon!*

They take certain leaves, and, after rolling them in the shape of a small funnel, they pass some drops of water through it into the eye, while looking at the Moon. This is very good for the sight. They count their days by the Moon, as do the Turks, and not by the Sun: instead of one month they say one Moon. They don't say, *How many days will you take for your trip?* but, *How many nights will you sleep?*

Their counters are their fingers. To express 12, they show their two hands and two of their toes; if the number exceeds the fingers and toes they say "*Tamieati,*" much. If there is a great quantity they show their hairs or a handful of sand. When they have to meet at an appointed place on a fixed day to make war, they each take a certain number of stones in a calabash, and take one out every morning, and when there are no more left they know that the time fixed for departure has come and that they must start. Sometimes, they make notches on a piece of wood; or else they make so many knots in a string and undo one every day.

In the beginning, then, the earth was soft, but the sun made it hard, as are the heavens; up above there are nicer fields than here, nice savannahs, fine rivers: *Oüicou* (a kind of beverage like beer) running everlastingly. No water is drunk there, the houses are

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better made, they have more women there and a number of children, no work is done, every thing grows without being sown ; one does nothing but drink and dance, and one never gets ill. What they say of the origin of the sea, and of waters in general, resembles in some degree the account of the deluge. The great master of the *Chemeens*, who are their high spirits, being at that time vexed with the Caribs, who were then very bad, and had ceased offering him any more cassava and *oüicou* caused rain to fall so heavily for several days, that nearly all the Caribs were drowned, with the exception of some who saved themselves by means of small boats and landed on the top of a mountain, which was then the only one. This deluge caused the formation of hills, rocks, and the separation of islands from the mainland. When asked where the waters came from, they say that there are rivers in the higher regions and that the first waters came from the urine and sweat of the *Chemeens*. This is why the sea is salt; and they say that fresh water is the result of water from the sea passing through the earth and getting purified.

RACUMON was one of the first Caribs made by LOUQUO. He was transformed into the shape of a large snake with the head of a man. He was always seated on a *Cabatas* (a hard and high tree). He lived on its fruit, which resembles a large plum or small apple, and which he gave sometimes to those who passed. He is now changed into a star.

SAVACOU was also a Carib. He was changed into a large bird, he is the captain of the storms and thunders; he has caused the heavy rains, and is also a star now.

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ACHINAON, a Carib, at present a star, causes light rain and strong winds.

COUROUMON (a Carib), also a star, causes the heavy sea waves, and upsets canoes; he is also the cause of flood and ebb. CHIRITIES, the *Pleiades,* they reckon by, and observe the years by this constellation, but, they know not how many it is since the first of them came from the mainland to inhabit the islands, neither know their age. They know not where we come from, but they call us *Balanaclé, i.e., Men of the Sea,** and believe that we were born out of the sea, and had no other dwellings but ships. They believe now that we are from a different world, and that our God, who made the sky and earth, but not their lands, is not theirs. As they knew not that there were other countries besides theirs, the first time that they saw ships and heard guns, they believed that these were devils, and that the men and ships had come from out of the sea to convey them away and occupy their land. They ran away and hid in the bush. They found out that they were mistaken in one of these points, but right in the other; and they wished that we had never put foot on their land; and, whatever they may pretend, they hold us in great aversion, though they are no longer to be feared, for many have been killed. I think there still are about 4000. Of the twenty or thirty islands which they once possessed, they now only occupy two or three. They are now mostly subject to the French, Spanish, English, or Flemish. The first time they saw a man on horse-back, they thought that

* To this day the men of the Carib tribes in Guiana call us "*Paranikeri.*"—ED.

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rider and horse were of one piece, that the man was part of the beast. They did not dare approach it. There are some at St. Vincent who have never yet seen Christians.

They call the Sun *Ruler of the Stars*, and think that it is his bright light which prevents the shining of the stars by day. Yet they believe that the stars retire and come down in the night. Lightning is caused by SAVACOU, when he blows fire out of a large gun. COUALINA is captain of the *Chemeens*: LIMACANI is a comet sent by the captain to cause evil when he is vexed.

JOULOUCA, the *Rain-bow Spirit*, lives on fish, lizards, pigeons, and humming birds, and is covered with fine feathers of all colours, especially on the head. He is the rain-bow which we see; the clouds prevent us from seeing the rest of the body. He makes the Caribs ill when it finds nothing to eat above. If this fine Iris appears when they are at sea, they take it as a good omen of a prosperous journey. When it appears to them while they are on land, they hide in their houses and think that it is a strange and masterless spirit which seeks to kill somebody.

Of their Chemeens and of Maboia, who are their good and evil spirits, and of some of their devilish superstitions.—As a proof of the bestial nature of the Caribs, it may be told that they are never willing to go and enjoy the delights which they say are above, because they must first die; and, as, they have no other desire but those of the present life, they get angry when they are spoken to about going to Paradise. They are altogether unwilling to leave their present goods for future ones, quit what they possess for what is unknown to them, or

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leave the pleasures that surround them for eternal delights which they cannot see. They take great care of their health, and fear death so greatly that they object to any one speaking about it, fearing to hasten it. In order to live longer they would give themselves up with pleasure to the devil; they never mention the names of the dead, fearing that it may oblige them to think of death and that this would make them ill. They say *The husband of so and so is dead*, or *The wife of——is dead.*

There are certain woods, with the heart of which they would not dare rub their skin or face: they say it would cause the beard to grow and make them look old before their time.*

They believe themselves never to get ill, but to be bewitched; and, simply for a head-ache or stomach-ache, they kill or cause to be killed, those whom they suspect to have given it to them. It is generally a woman, since they dare not openly attack a man.†

But, before killing her, they ill-treat this unfortunate person most cruelly. Their parents and friends go and fetch her, she is then made to search in the earth in different places, and ill-treated, until she finds what they believe her to have hidden; and, very often, the woman, in order to deliver herself from her executioners, confesses what is not true, picking up some pieces of shell, *Burgares, Lembies, Erabes* or fish bones. *Butgos* are a sort of shell very common in the Antilles and on the mainland; it is found on the sea side.

* Our Guiana Caribs call even young men if bearded "*Amoko*" which means 'old man.'—ED.

† A quite undeserved charge of cowardice, I believe. ED.

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Lembies are large shells seen sometimes behind the show glasses of Paris apothecaries. These *Lembies* serve for two purposes, as trumpets by means of which they signal from great distances. They have different sounds by which they make known their wants, the success of their enterprises or of war, of hunting or fishing, and in accordance with which often one or two hours before their arrival the women prepare the kettle or boucan or the necessaries to dress their wounds. One will not be sorry to learn here that the fabulous patience of GRISELDY is surpassed by theirs in the fabrication of certain necklaces with which they ornament their heads on days of ceremony. They call them *Clibat*, and the savages of Canada, *Pourcelaine*. These are of small pieces of these *Lembies,* which they rub on stones until they have become round and about two lines in diameter and ½ line in thickness in a necklace of ordinary size; as several rows are worked in, there are 3 to 4 thousand of these pieces in a necklace, and they could not make one piece to perfection and pierce it with the tools that they use in less then 3 days: it is a fact that amongst the whole number not one will be found varying by the thickness of one hair.

They also make these kinds of necklaces from the seed of the black palm. These glisten like jet when polished. These pieces are a trifle longer and are less in diameter, and are notched at the extremities.

When the women who are accused as witches pick up these different shells they say that it is the remains of what the bewitched had eaten, which the pretended witch had buried in the ground. Many incisions are then made on her body. She is hanged by the feet; a

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kind of very strong pepper, called *Piman*,* is then rubbed in her eyes, and she is left for some days without food, until a drunken executioner arrives and puts an end to the unfortunate being by breaking her head with a club. I know all this from having saved two of these people.

They adopt the *Chemeen* that they like best as their good spirit. They consult the Devil through their Conjurors or *Piaye* Doctors, as to their recovery from sickness, as to their whereabouts at sea in bad weather, as to the issue of their wars, or to learn the names of those that have bewitched them. Each *Piaye* has his particular *Chemeen* (spirit), or familiar devil, and they are governed by the evil counsel of these detestable sorcerers, also known by the name of *Eocheiri*.

To know the cause of their illness they send for a *Piaye Boyé*, or sorcerer, at night, who orders all the lights in the house to be put out and turns the suspected persons out: he then retires into a corner, where the sick person is brought to him, and, after smoking a piece of tobacco, he mashes it in his hands, and blows it in the air, shaking and flipping his fingers. They say that the *Chemeen* always comes on scenting the odour of this incense, and, being interrogated, he answers with a clear voice, but sounding as from a distance. The sorcerer then approaches the sick person repeatedly, feels, presses, and manipulates the suffering part, always blowing on it, and extracts sometimes from it, or rather appears to extract, some thorns, or small pieces of cassava, wood, or bones, making the sick person believe that this was the sole cause of the pain. Very often he sucks the painful part

* *Peemi* is applied to all kinds of "red peppers," *i.e.* capsicums. ED.

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and immediately goes out of the house to vomit what he calls the poison. The poor invalid is thus cured, more through imagination than anything else. It is to be noted that he cures no fevers, or wounds, caused by an arrow or knife. At these meetings, the profoundest silence must reign.

They present to the *Chemeen* and the *Piaye*, oüicou, and cassava, on a *matoutou*, leaving it there the whole night. The *matoutou* is a small kind of table one or two feet square and half a foot high. They so regard the offerings, called *alakri*, that only old men, and the most distinguished amongst them, can take it. They have asked me some times to drink of it, and I have done so just to try and change their superstitious ideas, one of which is to drink of this oüicou before eating, otherwise you die, and purposely I ate first before drinking: another is to keep the cup straight so as not to spill the contents, otherwise the eyes would run water everlastingly. I purposely spilt some, and held the cup crooked. If a patient recovers, a feast is given to the MABOIA, at which the *piaye* is always present. Towards the end of the feast the convalescent is darkened with junipa apples* and rendered as handsome as the devil. They offer to the *Chemeens* the first fruit of their fields, without any ceremony. When they have a great feast they always put aside a goglet, or some calabashes for the *Chemeens*. They regard bats, which they call boulliri, as *Chemeens* (or spirits) guarding them, and think that whosoever kills these will get ill. They have a great number of boule-Bonum, which means bad omens. A *Piaye* (sorcerer) is

* The fruit of *Genipa Americana*, in Guiana called "lana" and still used by the Caribs to dye their skins of a dark blue-black colour.

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trained from his youth to the work ; he is made to fast for five months on bread and water in a small hut, where he sees no one ; his body is scraped with acoury teeth, he is made to drink tobacco juice until he faints, and, when they say that his spirit has gone to the *Chemeen*, they rub his body with gum and cover it with feathers to allow him to fly to the *Chemeen*. He is taught how to operate on a sick man by feeling, sucking, and blowing on him. They do not fear the *Chemeen*, because he is good and does not harm them ; but they fear MABOIA who harms them ; and I believe that it is in order to coat him that some wear a hideous figure of him round their neck, or carve it in front of their canoes. They told me that it was to frighten their enemies, when they went to war, who when they saw this horrible figure with open mouth, were afraid to be devoured by it, and remained so terror-stricken that they could not paddle any more, and were consequently easily caught.

The Arawaks are a nation settled towards the borders of the Orinoco river, and are everlasting enemies of the Caribs and Galibi. * The Indians have often very fearful dreams, in which they seem to see the devil. At night I have heard them, sometimes two at once, complain, cry, wake with a start, and tell me that the devil wanted to beat them. They went on screaming when quite awake, and really made enough noise to drive the devil away. Their melancholic temperament evidently contributes to these visions. They sometimes put the hairs, or some bones, of their deceased parents into a calabash. They keep these in

* Galibi is merely another form of the word Caribi, but seems only to have been used of the Caribs of the mainland.

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their huts, and use them for some sorcery. They say that the spirit of the dead one speaks through these and forewarns them of the designs of their enemies. They believe that they have several souls. The first near the heart, called *Gonanni* or *Lanichi*; the second at the head; and the others at all the points of the body where there is pulsation of arteries. Only the first-mentioned goes to the sky after death; and changes into a young and new body, the others remain on earth changed into beasts or in MABOIA. All these spirits are of different sexes and multiply.

The Caribs have a sad temperament, and are dreamy and melancholic. Sometimes they remain a whole day on one spot, their eyes fixed to the ground, without saying a word. Fishing, laziness, and the air, must contribute very much to this temperament of theirs; and they are never jolly but when they have drunk a little too much. They are very splenetic, and get vexed; they have no wit, though they believe themselves to have more than any other nation, as also that they are the best made. They laugh at us when, while walking we stop to speak. They get offended when they are called savages, and, told that they live like beasts, and they answer that we are just as bad in their estimation, because we don't live according to their fashion: that they have their way of doing things and we have ours.*

When they want to make friends, they ask for our names and give theirs. To show affection and friendship they want us to exchange names, and, to get very

* Some two centuries after La Borde wrote this, we still have not sufficiently realized that the uncontaminated fashions of the Red Man were not altogether ignoble or savage.

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intimate, little presents are continually given on both sides. Never let them leave without giving them a small gift: they even expect payment from those who want to make them Christians, for their trouble in listening.*

They are very inquisitive; and when a box is opened they want to see every thing in it; otherwise they get vexed. I find them ungrateful, because, if you begin to be kind to them and stop, they forget the past; and, if you refuse the smallest demand they try to harm you. They last better than we do: the old men do not get gray, and live longer.† The reason is, I believe, that they eat little but often, and have neither anxiety, ambition, nor trouble. They take their food when they are hungry: even at night they will get up to eat, and only think of the present. If you want to get a hammock from them cheap, you must buy it early in the morning, when they forget that night must come and that then they will require it. When making bargains they prefer glass and crystal to gold and silver.

We eat fruits, but the Caribs drink these. ‡ They say to drink a melon, figs,‖ bananas, plums, pine apples, etc., in fact, they drink more than they eat, even dry fruits like the courbaly. They are very uncleanly in their habits; they never eat salt, because they believe

* An Indian may even now-a-days be induced to undergo baptism for a shirt or a drop of rum.

† This is certainly no longer the case in Guiana.

‡ Indians usually boil down or merely pound, all sorts of fruits into a pap.

‖ These figs must be fig bananas, a small kind of banana called by our Indians kokerites, to distinguish them from the larger kinds which are called "bacoobas."

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it be unwholesome, but, instead of salt, they use a great quantity of pepper. * They will eat jiggers and lice, because, they say, these insects bit them.

When they eat, they never invite anybody to join them. The stranger, if hungry, must take a seat near them, of his own accord, and eat and drink with them, as if he belonged to the house.†

They never speak or drink during meals: their conversation afterwards is generally about fishing, hunting, travelling, etc. They are very vindictive and will nurse a hatred not for one year only, but for life, and do not rest until the enemy is killed: often for very little cause, such as for broken arrows, for a knife, for a word. Sometimes on account of their wives, with whom they cohabit in numbers, and without distinction of parentage. I have seen some that took their daughters for wives, and left them whenever they pleased. There is no nation more inclined towards drunkenness, and, it is when intoxicated that they slay one another.

They are quite independent, and this is a great obstacle in trying to convert them. They do not obey their father, and the father does not command his child.

The captain of a boat will never order his men to pull, they work as they like. It is not the duty of the captain to steer, he has only to bale the boat.‡

* Indians now are very fond of salt and will go long distances to procure it. The peppers used are, of course, capsicums.

† According to the Red Man's *Code* of hospitality, the stranger in the house is, in the fullest sense of the words, at home.

‡ This custom, strikingly different from anything to be seen among the Indians of the mainland, must have been a peculiar adaptation to the sea-going habits of the Redmen of the West India Islands.

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They were believed to be very chaste, but I can affirm the contrary. * * * * Though they have several wives there is not much jealousy amongst them. They have women in different places, when changing from one spot to another. This is another obstacle to their conversion. Our Caribs have as much shame in being clothed as we have in being naked; but if any of them do dress they are vain enough to want the *finest and whitest* stuff.

Their Occupation and Work.—Their first occupation before day-break is to bathe in fresh water. They believe that sea water would make them stink, and would encourage bile. The women take the hammocks into the next hut, and then bring fresh casssava and *Taumaly*. This *Taumaly* is a kind of soup made out of crabs, meat or fish, with plenty of peppers. They pass the day in making baskets which are used to keep tools, such as a looking-glass, cotton thread, a razor, etc.

They also occupy themselves in pulling out their beards with their nails, or with the point of a knife. Some play the flute, others extract jiggers, or dream or sleep in their hammocks. When lying down they always have fire under them, and gather round it at night to converse.

The men would rather die of hunger than make cassava-bread, boil the pot, or do any work whatsoever.* The women must search for and split wood for the fire. The men will accompany them, but it is only to protect them, and very often they will not even help

* I have before pointed out that, at least in Guiana, the division of labour between the sexes, though at first sight unequal, is in reality very fair.—ED.

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a poor woman *enceinte* to discharge her load of wood. If the women have not prepared food when the men happen to be hungry, the latter simply go and eat with the others; similarly with regard to painting and combing, if the wife is not there to help them, they expect others to render them these services. While the woman plants the cassava and cleans round the house the man will look after the children.

After getting one or two crops from the field, they abandon it and make a new one. The trees are cut down; only the small branches and leaves are burnt, the stumps and roots remaining in the earth, and the women plant their cassava, sweet potatoes, plantains, etc., wherever it happens that there is room.

Of any three canoes that they begin to make, two always get rotten or spoiled before they are finished, on account of their laziness; and, though their fields are generally not large, they take such a long time over them, that very often one end is spoiled before the other is finished. This is true also of their houses and of all their work. The thatch on one side is often worn and spoiled before the other side is ready for the leaves. The old men always do the hardest work, and cut down the biggest trees. They only work one or two hours daily, and never two days running. They are all very indolent, and it is not difficult to get them to observe GOD'S commandment prohibiting work on Sunday. Every day they ask when Sunday will come. After returning from work they wash immediately and are combed.

The women are not so lazy as the men, and are like slaves to them; they plant the cassava, not with spades

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as we do, but with long, pointed sticks. They weed the fields, make bread, and cook the meat. They spin their cotton, not with a spindle, but on their thighs, make hammocks, get fire wood, make palm oil, etc. The men make the houses and canoes, but the roofs are made by the women. The hammocks are made on frames resting against the posts of the hut. When finished the hammock is dyed; that is, if it is for their own use, but, if made for a European, they leave it white. The ornamentation is generally a kind of waved work, in which the pattern is made as duly and exactly as though they had used a rule and compasses. The women are just as dirty as the men in all they prepare; in making their common drink, which is prepared of boiled cassava or sweet potato, they not only pound these fruits in a mortar, but also chew them to facilitate fermentation. Besides this beverage they make other kinds out of Carib cabbages, pine-apples, figs, bananas, but these beverages are so thick that they are rather to be eaten than to be drunk. Their meetings to drink this *oüicou* are their great festivities and debauches. Two or three families are invited, and, they will drink 10 to 12 barrels in a day and night without eating. These feasts always finish by someone getting killed or wounded, because, towards the end, men, women and children are all drunk. When the women make hammocks they place at both ends a small parcel of ashes. Unless this ceremony is observed the hammock would not last. Should they eat figs when they have a new hammock, they think it would get rotten. They take great care also, not to eat of certain fish with sharp

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teeth. For this would cause the hammock to be soon torn. These beds, or hammocks, are generally 8 to 10 feet wide, and 4 or 5 long, and are hung at a little distance from the ground, to forked sticks. They are painted with roucou, diluted with oil, in so many different ways, that one seldom finds two alike.

*Calaba** oil is made from palm seeds and serves to oil their hair.

Roucou is a red paint which they rub on their body. It is made with oil and the seeds which grow on a tree like the cotton tree.†

Their canoes are made of a tree, which is hollowed by means of fire and a hatchet, about 25 to 40 feet long and 5 to 6 broad, capable of conveying 30 to 40 persons. While being burnt out, sticks are placed across so as to enlarge it. If a woman did but touch it with her fingers, they believe it would split. They never go to war without first having a great drink. There they deliberate and decide all state questions. Their war consists of attacks on the enemy, never openly, but by hiding in the bushes and trying to surprise the enemy. After killing a person or burning a hut they hastily retreat. If they are discovered, or if even they hear the barking of a dog, they will not follow out their purpose but return without doing any thing. They carry away their dead, and it is then that they lose most of their people.

A savage of St. Vincent showed me the foot of an

* Calaba oil, is I suspect crab oil, which is prepared from the seeds not of a palm but of a tree called Caraba *(Carapa guianensis)*; or possibly the Indian word Carapa is applied to any oil tree.

† The tree is *Bixa Orellana*, called by the Indians of Guiana, *Faroah*

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Arawak which he had in his basket. They only eat the Arawaks now, savages from the Orinoco. They say that Christians would give them stomach ache, nevertheless not a year ago they ate the hearts of some Englishmen.

Many negroes live just as the Caribs, especially at St. Vincent where they have their stronghold. Some of these are escaped prisoners in war by the Caribs and are called Tamons; but most of them came from a Flemish or Spanish ship which was wrecked near these Islands.

Their (Caribs') arms are bows and arrows, the club, and the knife. The bouton is a kind of club made out of green-wood or hard brasil-wood, massive, heavy, 2 and 3 feet long, and carved according to their custom. With one blow they kill a man. The arrows are always made long before hand, and in great quantity. They are made out of the hollow joint which grows on top of a certain reed about 4 or 5 feet long, polished, without knots, and light as a feather. At the large end of this, they adjust, instead of iron, a piece of green wood, ½ foot long, with several notches on it, so as to prevent it being drawn out easily.

The ends of these are poisoned with the juice of a tree called *Manceniller*, and the fruit *Mancanille*, a name given by the Spaniards, because this fruit resembles apples. Many Europeans were poisoned when the West Indies were first discovered, by eating indiscreetly of these fruits. An incision is made in the bark. The juice which comes out is as white as milk, and much more deadly than snake poison for their arrows. They sometimes use certain long fish-bones, taken from the tail of the ray. These bones are poisonous, and

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are as dangerous as the others. They never undertake a journey without putting on the best *Caconnas*, and combing and painting themselves. When they arrive at a house, the master hangs the hammocks for the headmen, the women bring drink and food, and as soon as it is put in front of the captain of the boat, the pullers carry everything away, so that very often when the host has nothing more to offer, and is pressed by hunger, he is obliged to abandon his dignity and eat with the others. When quite satisfied they say the *Mabony*, *Good bye* to everybody. When at sea, they blow a large conch shell, to let the neighbours know that they are friends, and that they are journeying. Even a single Carib arriving at a hut, is well received. If the cassava that is offered to him is folded on the matouton it is a sign that he must leave what he does not eat; if on the contrary, the cassava is spread, he can take it away; and, before leaving, a woman will paint him with *roucou*, and also comb his hair. When they have to cross over sea to go to another island like St. Alousi, or St. Vincent, they eat no crabs or lizards, because these animals live in holes; consequently this would prevent them getting to another land. No pure water is drunk, and they are very careful not to spill any in the canoe or in the sea; it would cause the sea to swell, and make rain and bad weather come. They drink a mess composed of ground mauky. The thick part is eaten separately and looked upon as a delicacy. When approaching land, this must not be named or pointed at, but it can be noticed by shouting Lyca, *It is there*, because they might never be able to land. They cannot pass certain places at sea without throwing over food. It is for some Caribs who have

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perished there, and now have their huts at the bottom of the sea. They could otherwise not pass without the boat capsizing. When a storm cloud is seen, they all blow in the air and drive it away with their hands to turn the rain in another direction. To make the sea calm and allay a storm, they chew cassava, then spit it in the air and sea, to appease the *Chemeen* (spirit) who is perhaps angry because he is hungry. If they have an unfavourable wind, an old man out of the crowd takes an arrow and hits the hydrant of the canoe, which is supposed to let the canoe go as straight as an arrow, if a gust of wind makes them lose sight of land, they consult the devil. When they require fire they make it with two pieces of dry wood, applying one to the other and turning it in their hand very quickly.

The Caribs are not badly made and proportioned, of middle height, with broad shoulders and hips, nearly all in good condition and robust. Very few of them are deformed. Most of them have round and full faces, and the mouth slightly split, perfectly white and closed teeth and naturally tawny colour. This colour extends to the eyes which are small and sharp, but their heads and noses are artificially flattened, the mother compressing them at birth and during the time they are suckled, thinking it beautiful. They have large and hard feet, because they walk bare-footed; very black and long hair which is combed and oiled often and cut in front, the rest of the hair is tied behind with cotton bands. They wear no beard, but pull it out with the point of a knife; and before they had razors they used a very sharp kind of grass.

They alter their natural colour by rubbing their skins

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with a red paint diluted with oil, called *roucou;* the old men only apply their fingers, spotting their whole body from head to foot, the young men besmear their whole faces and paint Spanish moustaches. One eye is painted red, and the other black, and with this they regard themselves finer and braver; others, instead of *roucou*, blacken themselves with *Genipa*.* The ears and the part between the nostrils and the under lip are pierced. The woman, a fortnight after delivery, calls in an expert to perform this ceremony on the child. As soon as the hole is pierced, with a palm pin, a cotton thread is passed through it, and if it is a girl she names it after a tree, an island, a fish, bird or anything. They don't take the father's name, each has his personal name. In their ears they wear small caracolis. Caracolis are small pieces of metal in the shape of crescents, thin as paper, and glittering like polished copper or gold, which do not rust or turn colour.† They get them from the Spaniards, and sometimes they pay a negro for one of these caracolis, and prefer it to any ornament. They wear as a shoulder belt a large collection of all sorts of animal's teeth and tiger claws. They wear their bracelets above the elbow and garters at the ankles. Sometimes they have on the back dried wings of a bird or a dozen claws attached to a piece of tiger skin. Some of the old men wear round their neck small bones of Arawaks (their enemies whom they eat) and make flutes out of these. The head dress of the women is like that of the men; when they put no feathers they rub the hair with oil, and tie it with cotton,

* This is the "lana" of Guiana—*Genipa americana.*

† On these crescents of gold, see a note in my "Indians of Guiana."

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to the end of which they attach small shells. They also wear necklaces made out of large crystals and green stones,* which come from the Mainland, towards the Amazon River, and have a healing virtue; it is their precious ornament and is only worn at feasts. They also *roucou* and blacken their body and paint on their forehead a kind of veil which makes them look like a widow with crape on. They delight in painting their little children, using brushes made of their hair. The women bring forth children with little pain, and, if they feel any difficulty they use the root of a plant which relieves them. They often deliver near the fire, and the child is bathed at once; but a funny precaution is, that if it is born at night, the men who are sleeping in the house go and bathe so that the child may not catch cold. The next day the mother attends to her household duties as if nothing had happened; she fasts for a couple of days, eating only dried cassava, drinking warm water, and abstaining from eating female crabs, which would give the child stomach-ache. If it is a first born and a male, the husband, as soon as the woman is delivered, goes to bed, complains and acts as though he had been delivered, for this he goes to a different house and undergoes a fast of three months. The first ten days, he only takes a little dry cassava and some water; afterwards, he begins to drink a little *ouicou* but abstains from everything else; he eats only the middle of the cassava and keeps the rest for the feast at the end of the fast. He goes out only at night, sees nobody for fear of meeting a drunken body or one who has eaten fish; this might tempt him and cause him to break his fast, the mother would become ill and the child

* These are the well-known "Amazon stones."

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not be brave. When the time has expired the oldest in the house choose two Caribs to scrape this pretty fast, and, on the appointed day he is brought to a public place, looking like a skeleton, and standing upright on two large flat cakes of cassavas. The sponsors then begin to scratch and cut his skin with very sharp agouti teeth. They first begin on the sides, then the shoulders, from the arm to the elbow, from elbow to wrist, and from the thighs to the ankles. He suffers this torment without saying a word, and not without trembling, because, after such a long fast, natural heat is absent, and this effusion of blood chills him; they draw so much blood that from an imaginary invalid they turn him into a real one. He is then painted and rubbed with *roucou* leaves, pepper seeds and tobacco juice, and placed on a red painted seat, the women bring him food, which the old men put in his mouth, as they would do to a child, the cassava and the fish being in small pieces; he eats the cassava, but ejects the fish after chewing it. He would become sick if he began to eat too well at once; he is made to drink by being held by the neck; he must eat the two cakes of cassava on which he has stood; and with the blood which fell on it, the child's face is rubbed. This will make it generous and brave according to the patience shown by the father. After this ceremony he is put to bed for a couple of days, but it does not end there. For six months, not only with the first-born, but whenever their women get a child, they must abstain from eating certain animals, from fear that they may participate in their natural faults. If a father ate turtle, the child would be heavy and have no brains; if he ate a parrot, the child would have a parrot nose; if a crab, the consequence would be long

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legs. The long fast is gone through only for the first-born; for the others there is only a dieting of four or five days. The women take great care of their children, and convey them everywhere in their arms, or in little hammocks slung round the neck. As soon as the children are sufficiently strengthened by the mother's milk, they are fed on potatoes, plantains, or other fruits. They are apt to eat earth, which is due I believe to their melancholic temperament. I have seen grown up people eat chalk with as much satisfaction as sugar. When the children are 4 to 5 years old, the boys follow the father, and the girls the mother. They are brought up like brutes. No politeness whatever is taught to them; not even to say *good-day*, *good-night*, or to thank. When grown up, their accomplishments consist in knowing how to shoot with bow and arrow, to swim, to fish, to make baskets and the girls cotton hammocks. If a man gets wounded or ill, he will ask his brother, sister, or some relation, to abstain from eating such or such a thing. This would make their pain worse even if they were 50 miles off. When the girl becomes marriageable, she is made to fast in her hammock for ten days, on dry cassava and a little *onicou*. If the poor girl, pressed by hunger, should, during the night, take a piece of cassava, she is sure to be a sluggard and not likely to work. When one is to be made a captain, a bird called *onachi* is caught; the father assembles the oldest of the tribe; makes his son stand on a little seat, and, after exhorting him to vengeance on his enemies, he takes the bird by its legs, and breaks and smashes the head. He must show no sign of grief, otherwise he will pass for a coward. The heart of the bird is torn out, and he is made to eat it so

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that he may have the courage to eat those of his enemies; he is then scraped and rubbed with the bird soaked in pepper water. He is then made to fast for a couple of days in his hammock, and his food is taken to him, not by a woman, but by a man, or he would be less generous. Some cannot stand the whole initiating. No great ceremony is observed for marriage. Sometimes the men make their own choice and demand, but, generally, the girls are offered to them by the father or mother. Some, without saying a word, go and lie down near the girl that pleases them best, and the mother acquaints the daughter that it is time to get married, though, often, she is only 12 years of age. The next morning, she combs her master's hair before the others, and brings him cassava. Through this public act their wedding is declared. If a Carib asks a widow, he only gives her three days to reply. An old man sometimes takes a young girl; and an old woman without teeth a young man. They have a great liking for these old witches. There are mothers who turn their children into prostitutes when they begin to mature and are not taken to wife. Some marry their own daughters, some, a mother and a daughter, others two sisters. Some have six or seven wives in different places, and, were it not that they had to feed them, they would take more. When a woman is *enciente,* a Carib may ask the father or mother for the child. In case it is a girl, and the mother promised it to him, he will mark it with a red cross on the stomach, (like a beast at the market). When the girl is seven or eight years old, he begins to make her sleep with him, though he has other wives. This child may be a very near relation of his. The woman continues to live

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in her father's house after the wedding, and she enjoys more privileges than the husband, because she can speak to everybody, but he cannot speak to the wife's relations without great caution, or when he finds them in liquor. They always shun such meeting. They have few remedies in cases of illness. They simply use plain herbs for wounds, and even if the sick person were on the eve of dying, he would only be fed on food to which he was accustomed when in good health.

When a Carib dies the women wash him, comb and rub roucou on him; place him in a hammock and paint his lips and cheeks with vermillion: afterwards he is wrapped up in the hammock and buried. The hole is dug in the hut, he is placed in a sitting attitude, resting on his heels or with the arms across the chest, with two weights on the eyes, that he may not see his parents and not make them ill. They make fire round the tomb to purify the air and that the deceased may not catch cold. All his goods are buried, a man covers him with a board, and the women throw earth on it. If the deceased owned a negro, the latter is killed in order to serve his master in the other world. His dog is also buried to guard him and watch those that caused him to die. They then begin their screams. The whole hut resounds with tears and groans; they are seen dancing, crying, and singing together, but in a doleful voice. They say only two or three words at a time, such as: *Why are you dead? Were you tired of life? Did you not have cassava enough?* repeating the same thing.

But, if he has been killed, they will say something against the murderer, and praise the defunct. If he has relations in other huts they all meet to cry, and the

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widow is present and gives *Caconnis* to those who cried the best, and as a last sign of their mourning, they cut their hair.

I have been told that, formerly, they burnt the bodies of their captains, and mixed the ashes in their drink; but, this custom is abandoned now, because there were no braves more. Some Frenchmen wanted to make me believe that they (the Caribs) killed their fathers when they were too old, as being useless in this world; and, that it was rendering them a great service to deliver them from their troubles in this world; but, the Caribs have assured me that this is not true: in fact they love this life too much. The dances, which are a sign of joy with these people, are also a sign of mourning. They dance differently at funerals, or at meetings as of moon, sun, eclipse, or when there is an earthquake. They dance four days and four nights in the moonlight. They say that the earth, in trembling, advises them to dance in order to feel well. They wear their finest dresses, ornaments, rings, necklaces, garters, etc. They have different sorts of dances and imitate animals. They dance standing in rows: men on each side, and going through a thousand monkey antics. Sometimes they lie down with the finger in the mouth, and at each refrain they get up and scream. The women are a little more modest they look at the movements of their feet and hold their breasts. *To wind up, they all intermix.*

Though there is some difference between the language of the men and the women they of course understand one another. The old men when they are planning a war, use a speech which the young ones do not understand. Their language is very poor, they cannot even express

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the operations of the spirit, and if beasts could speak, I would give them in preference the Carib language. They have no word to express religious things or justice; and of virtues and sciences they have no knowledge. They can only name three or four countries. The Reverend Father SIMON of the Society of JESUS, who has worked with great zeal to convert them, compiled a dictionary with a grammar, or simple catechism; and some familiar discourses on the divine mysteries of our belief. I could extend this pamphlet, but enough has already been said to make known the Caribs. There is only a little nation left of them. Moreover, they destroy themselves daily; and the English endeavour to destroy them utterly. GOD, I believe, permits the whole of Europe to seize upon the county of these people, because they are so great a disgrace to their Creator, whom they will not recognise. Notwithstanding all that has been told them during the last twenty years, they laugh at it; and the only hope of making them Christians, would be first to civilise them and make them men. Providence which does nothing without a motive will at her own time provide for this.

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Agricultural Societies in British Guiana.

AN HISTORICAL SKETCH.

By Thomas Watt, Editor of the Royal Gazette, Georgetown, Demerara.

I AM not aware of the existence of any collection, or indeed that any attempt at collection has ever been made, of the records of the Agricultural Societies of British Guiana. Some years ago, in England, I was called upon to undertake the compilation of a history of a Literary and Philosophical Society, and the task proved a comparatively easy one, inasmuch as printed copies of the minutes and proceedings were fortunately extant from the outset of its career. Had similar facilities been at hand here, I doubt not that we should ere now have been able to boast of a fairly complete and authentic account of the doings of the Agricultural Societies which preceded the Institution under whose auspices *Timehri* is published. But such ready material is not accessible here to the would-be compiler. Few, indeed, even of our institutions of the present day that can lay claim to an existence for any length of time, are in a position to produce original archives of the past. Hence it is that in seeking to bring together in something like connected and consecutive shape the records of many of them recourse must perforce be had to those "brief and abstract chronicles"—the newspapers, and to the fact that the data thus available, in the case of our Agricultural Societies, is scattered over newspaper

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files covering a period of more than half a century, may be attributed the absence of any history of these organizations. It occurred to me that in my present capacity, I might be able to undertake a compilation which if it effected nothing more would at least rescue from the obscurity in which they have hitherto been permitted to remain, some data appertaining to the most important events in the career of the societies in question; and that were I able to snatch sufficient leisure time from the all-engrossing occupation of a journalist for a task of this description, the material so collected might appropriately find a place in the Journal of the Royal Agricultural and Commercial Society. Unfortunately, I have not found it possible to devote to the work so much time and attention as I could have wished, but as an instalment towards the redemption of a pledge I have managed to rummage the colonial newspapers within the period from the establishment of the pioneer Agricultural Society to that from which the Society of the present day dates its existence, and such materials relative to this period as I have gathered I now proceed to lay before the readers of *Timehri*.

The first society whose existence I have traced was named

"THE AGRICULTURAL SOCIETY OF DEMERARY AND ESSEQUEBO."

It was formed in the year 1833, an eventful year, I need hardly observe, in the history of the West Indian possessions of the British Empire. I find that on the 21st May, 1833, a meeting of the proprietors of estates and planters, "being representatives of

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estates," who had expressed their wish to become members of an "Agricultural Society of Demerary and Essequebo," was held in a room over what was then known as the "Demerary Spa" in Cumingsburg. The conveners of this meeting were :—JOHN CROAL, GEORGE WARREN, JOHN MCLEAN, N. M. MANGET, CHARLES BEAN, J. H. ALBOUY, J. F. BOODE, EDWARD BISHOP, and U. F. BACH. Thirty-four gentlemen subscribed their names on this occasion, and the first regular meeting of the Society took place on the 12th June following, at which office-bearers were appointed, viz. :—N. M. MANGET, Chairman; G. WARREN, Deputy Chairman; ALEX. MACRAE, Treasurer; A. GALLOWAY, Secretary.

It is recorded that a letter was laid over in which the then acting Governor, Sir CHARLES FELIX SMITH, expressed his approbation of the establishment of an Agricultural Society in the colony, a copy of which letter was ordered to be inscribed upon the minutes, the original to be preserved amongst the documents of the Society. The rules which had been presented by a committee appointed for the purpose were adopted, and as a document of some historical interest I may be pardoned for desiring to rescue at least portions of them from the obscurity in which they have remained for over half a century. The rules enacted as follows:—

1. THE AGRICULTURAL SOCIETY OF DEMERARY AND ESSEQUEBO shall consist of Proprietors of Estates and Planters who are Representatives of Estates, and may be augmented by the admission, by ballot, of other persons who may be Representatives of Estates, but whose chief employment is not that of superintending the affairs of Plantations, provided two-thirds of the members present at a General Meeting vote in favour of the candidate.

2. The Society may be further augmented by the admission of other

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persons, under the following resolution passed at the general meeting held on the 21st May last, and confirmed this day (12th June):—

"That all Proprietors of Twenty-five Slaves and upwards whether employed as wood-cutting gangs or in agricultural pursuits, shall also be eligible to become members of the society by ballot in like manner, provided the owners of such slaves earn their livelihood exclusively from the employment of them on the soil, or from the productions thereof."

3. That all such persons as by Rule 1st, are entitled to become members of the Society without ballot, shall be bound to enrol themselves as members, and comply with the Rules, within the space of two months from this 12th June, if they are residents in the colony, or, if not residents, within two months from the period of their arrival in the colony, otherwise such persons shall not be admissible except by ballot, as in No. 2. A list for the signatures of such parties shall be lodged in the Society's Hall, which is for the present established in the room over the Demerary Spa, in Cumingsburg.

4. That the Society shall meet the first Wednesday of each month for the transaction of business—keeping regular Minutes of the Proceedings.

5. That the Chairman, Deputy-Chairman, and Treasurer now chosen shall continue in office until the first general meeting to be held in January next year, when a new election shall take place, and be followed up the January meeting of each year thereafter. That in the event of it being found necessary to have a Secretary to be remunerated from the funds of the Society, he shall be chosen by ballot at a general meeting. That a Standing Committee of Ten members, including the Chairman, Deputy-Chairman, Treasurer, and Secretary, shall be elected from among the members at this present meeting and shall continue in office until the regular period of election in the January of each succeeding year—vacancies occurring in any office to be filled up at a general meeting. It shall be the business of this Committee, five members of which shall form a quorum, to attend to the accounts, documents, and records of the Society, and to all communications addressed to the Society upon Agricultural, Scientific or Medical subjects, relating to the economy of Plantations. That the said Committee shall embody in a report the substance of such communications, for the better despatch of business and for the purpose of fixing the attention of members to the contents thereof; and they are required to bring the

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same forward at each meeting, together with the original documents, accompanied by such observations as may have occurred to them on a perusal of the same.

(Rule 6 fixed 12 o'clock noon as the hour for the general meetings, those of the Standing Committee to be held at 3 p.m. on convenient days.)

7. That each member of the Society shall be bound to pay the sum of f. 44 (forty-four guilders) as his fee for admission, and f 66 (sixty-six guilders) per annum, payable in advance; and no member in arrear shall be entitled to vote at any election or to take any part in the business of the Society. Defaulters to be reported by the Treasurer at each general meeting.

8. That the objects of this Society shall be improvements in the Culture and Manufacture of Colonial Productions, the protection and advancement of the Agricultural Interest in all that may relate to the abridgment of Manual Labour, improvements in Machinery, health and comfort of the population, and general economy of Plantations.

(Rule 9 specified that a roll of the members should be conspicuously exhibited in the Rooms; that candidates' names should be put up 14 days at least before ballot, and that no ballot should take place unless 17 members were present.)

10. The Society shall dine together twice a year, say in the last week of June and first week of December, to be notified by public advertisement, and the first Dinner shall take place on the 29th of June next; the Standing Committee being empowered to make arrangements for the dinners, and to announce to the members the cost of the tickets.

(Rule 11 related to the furnishing of periodical publications and newspapers for the use of the Society).

12. That Scientific and Medical men who distinguish themselves by forwarding the objects of the Society may be elected Honorary Members by a majority of votes at a general meeting, in pursuance of a motion made and seconded at a previous general meeting.

In addition to the *ex officio* members, six gentlemen were elected members of the Standing Committee, viz :— Honourable JOHN CROAL, Honourable GEORGE RAINY,

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and EDWARD BISHOP, A. GARNETT, JOSEPH BEETE, senior, and C. BENJAMIN, Esqs. The "best thanks" of the Society were extended to the Honourable Mr. CROAL, for the interest he had taken in connection with its formation, and also to Major STAPLES for the use of the hall of the Spa. The undermentioned newspapers and periodicals were ordered to be regularly obtained for the Society :—

Glasgow Courier, Falmouth Packet, Morning Post, Blackwood's Magazine, Quarterly Magazine, Felix Farley's Journal, Mechanics' Magazine, West India Reporter, Liverpool Standard, Halifax Herald, and Barbados Globe.

Here is a copy of the roll of members—48 in all—who had been admitted up to the 12th June, 1833, which is additionally interesting inasmuch as it may be assumed to comprise the leading planters of that period :—

William Arrindell, of Zeelandia ; J. H. Albouy, of La Penitence, &c. U. J. F. Bach, of Toevlugt, &c. ; H. J. Baird, of Orange Nassau Thomas Barry, of Vriesland ; Chas. Bean, of Richmond, &c. ; Chas. Benjamin, of Spring Garden ; Jos. Beete, senior, of pln. Best ; Jos. Beete, jnr., do. ; Edward Bishop, of Zorg, &c. ; Thos. Blake, of Vive la-Force ; J. F. Boode, of La Grange, &c. ; L. Breda, of Glasgow ; R. G. Butts, of Thomas, &c. ; Donald Cameron, of Sparta ; Gillis Cantzlaar, of Toevlugt ; John Croal, of Lima ; F. de Ridder, of Versailles, &c. ; John Evans, of Better Success ; Wm. Fraser, of Helena, &c. ; Thos. Frankland, of Elizabeth Ann ; Andrew Galloway, of Hoff van Holland ; Abraham Garnett, of Cuming's Lodge, &c. ; J. J. Gilgeous, of Windsor Castle ; Henry Halket, of Maria's Lodge, &c. ; Andrew Jackson, Representative of La Bonne Mere, &c. ; C. Imhoff, of Prosperity ; Jan. Koert, of Velzerhoofd ; J. A. D. Koolhas, Representative of Maria Johanna, &c. ; John McKenzie, Representative of Amsterdam, &c. ; N. M. Manget, of Schoon Ord, &c. ; Jacobus Meertens, of Vauxhall ; John McLean, Representative of Vreed-en-Hoop, &c. ; Alexander Macrae, of Endeavour, &c. ; Hugh McLeod, of Doornhaag ; Wm. McKeand, Representative of Hope, &c. ; John Noble, of Maryville ; J. V. Nedderman, Representative of Zeeburg, &c. ; John Pearson, of

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Demburg; Hugh Rogers, of Clonbrook, &c.; M. J. Retemeyer, of Little Diamond; Geo. Rainy, of Leonora, &c.; Alex. Simpson, of Montrose, &c.; Colin Simson, Representative of Sans Souci, &c.; Thomas Teschemaker, of Amersfoot, &c.; J. Van Waterschoodt, of Plaisance; George Warren, of Farm, &c.; Alexander Wishart, of Aberdeen.

The inaugural dinner took place as had been arranged, on the 29th June, 1833, the day on which, it may be noted, the new Governor, Sir JAMES CARMICHAEL SMYTH, held his first levee. It was early in Sir JAMES CARMICHAEL SMYTH'S administration that the institution of slavery received its first blow, and the first duty which the young society was called upon to perform was in connection with the great measure which had been heralded. On the 18th July, His Excellency directed to be published in the *Royal Gazette* (there was no *Official Gazette* until some nine or ten years later) a despatch which had been received from the Right Hon. E. G. STANLEY, Secretary of State for the Colonies, together with a copy of the "Resolutions for the Abolition of Colonial Slavery, agreed to by the House of Commons, June 12th, 1833." In a notice also published by way of preface to the foregoing momentous documents, Mr. T. G. HAMMILL, acting Government Secretary, said:—

"In thus frankly and openly communicating to the inhabitants, without reserve, not only the whole of the details of the proposed changes respecting the slaves, which have been determined upon by His Majesty's Ministers, but also the arrangements contemplated for carrying these measures into execution, the LIEUTENANT GOVERNOR has been influenced by two motives—In the first place, His Excellency is anxious to prevent the circulation of all garbled extracts (which might be transmitted here from other colonies) and which could only produce unnecessary excitement and alarm: and because in the second place, he is confident that the liberal and prudent measures as advocated and proposed by His Majesty's Ministers will, when once distinctly understood, be duly appreciated by the generality of the inhabitants of British Guiana;

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and be met by a corresponding desire and anxiety on their part, to do all in their power to preserve the public tranquillity, and to contribute their aid in effecting those changes (which every one must be aware are so decidedly inevitable) with the least possible inconvenience and loss to all individuals concerned.

The LIEUTENANT GOVERNOR has directed it should be stated, in conclusion, that he confidently relies not only upon the superior talent and information which he has witnessed with so much pleasure in this colony, on the great wealth and immense interests at stake, but above all, upon that spirit of moderation and good sense which has so strongly characterized the proceedings of the inhabitants of British Guiana, with respect to this most momentous question, to enable him to carry all the details into execution with the concurrence, co-operation, and assistance of all ranks."

This Government Notice was considered at a meeting of the Agricultural Society on the 6th August, 1833, Mr. N. M. MANGET, presiding. In all 48 gentlemen attended the meeting, whose views on the question of the abolition of slavery were embodied in eleven resolutions. Space will not I fear, permit of the reproduction *in extenso* of this manifesto, so to speak, of "the greatest portion of the resident proprietors, and of the representatives of absent proprietors, of estates in this colony." The resolutions are to be found, however, in *The Royal Gazette* of August 10th, 1833. The planters recorded, in the second resolution, their feeling, born of experience, of the peril which was to be dreaded incident to so sudden and premature a change in the existing relations of Master and Servant, and the "fatal embarrassments" which would be consequent upon its failure, but, "placing implicit confidence in the declarations of the British Government, and replying on the wisdom of the local Legislature to organize the details applicable to this colony of this great national experiment, so as to render the chance of the future beneficial cultivation of the soil as little

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hazardous as possible to the Planter," they promised cordially to co-operate in the endeavour to bring the contemplated measures to a safe and happy result. In the third resolution reliance was expressed on the justice of Parliament and in the National Honour, "for full and entire compensation for any ulterior loss or deterioration of property which may attend its failure." The other resolutions set forth the importance of a fair distribution of compensation, especially in the case of British Guiana, of which it was proudly stated that "the value of its exports, and the tonnage and seamen employed in its trade, far exceed in proportion to population, anything recorded in the history of ancient or modern colonies;" the speedy payment of compensation; and the propriety of a proposal being submitted to the Imperial Government "that in addition to the compensation, there be granted to this colony, a Loan of TWO MILLIONS AND A HALF STERLING, bearing 4 per cent. interest, with per 1 cent. additional as a Sinking Fund, to be secured upon the colonial revenue." The 9th resolution was thus worded:—

That the restraints upon labour, and the diminished production of the British West India Colonies, which must necessarily ensue, will enhance the profit upon the productions of Foreign Colonies still carrying on the Slave Trade. The British Planter has, therefore, under new disadvantages, to compete with Foreign Possessions, and unless afforded the salutary protection of Parliament in the Home Market, it is to be feared that the total ruin of the British West Indies will eventually take place.

Mr. MANGET, Chairman, and Mr. WARREN, Deputy-Chairman, of the Society, were appointed a deputation to wait upon the Lieutenant Governor with the resolutions, requesting that they should be forwarded to the Home

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Government. The deputation accordingly waited upon Sir J. CARMICHAEL SMYTH on the 7th August, who in his reply to their address observed :

The moderation and temper with which the decision of the Imperial Parliament, with respect to the important change in the state of the Labouring class, has been received in British Guiana by the great body of the landed proprietors, must for ever redound to their credit, and cannot fail to be highly acceptable to His Majesty, His Ministers, and the Mother Country at large. The line of conduct thus judiciously adopted, removes all ground of latent hostility, all feelings of asperity, from the minds of the working population. I trust, and hope, that when the Master and the Slave assume their new relative situations, when the moment does arrive that the Landlord and the Tenant, the Owner of the soil and the Labourer, have to enter upon their several duties—that, on the one side as there will be no ill-will towards their late slaves, so, on the other, there will be no wilful negligence, or insulting language or conduct, towards their late masters.

On the 5th September, 1833, the Agricultural Society offered a premium of Fifty Pounds Sterling to the person who, within three months should submit "the most approved method, in point of economy in its cost and utility in its effect, of constructing, a MOVEABLE RAILWAY and TRUCKS, for the purpose of carrying the Canes from the Fields to the Punts; and proving to the satisfaction of a Committee to be named by this Society, that such Railway and Trucks have been employed in such service so as to occasion a saving of labour to an extent to render it worthy of general adoption." Subsequently the period allowed for the competition was extended to December 31st, 1833. The period was further extended for six months from the 1st June, 1834, in consequence of only one model having been submitted "the original of which was known to be in operation," and "because the model was not accompanied by any documents or

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evidence to prove its being for the purpose set forth in the advertisement." I doubt whether the premium was ever claimed or awarded, at any rate a diligent search for evidence on the point has not been rewarded with success.

It was announced, on the 5th October, 1833, that a GOLD MEDAL of the Society would be awarded to the first Proprietor or Representative of an estate within the colony, who should prove to the satisfaction of a Committee "that he has applied the labour of not less than twenty persons of free condition, not apprenticed, profitably for a continuous period of twelve months or upwards, as labourers in the cultivation and manufacture of sugar on his estate or that under his charge." Here again I have failed to meet with any announcement of the prize having either been claimed or awarded.

A new invention by Dr. URE, for sugar boiling, was brought to the notice of the Society at the monthly meeting on the 4th December, 1833, and referred to the Standing Committee. In the evening a semi-annual dinner took place, at the house of Mrs. THOMAS, Parade Ground. This gathering was graced by the presence of the Lieutenant Governor.

The first annual meeting of the Society took place on January 8th, 1834, at which Mr. MANGET was succeeded in the Chairmanship by the Hon. JOHN CROAL, the deputy Chairman, Treasurer, and Secretary being re-elected, whilst Mr. MANGET and Mr. JOHN MCLEAN were added to the Standing Committee in the room of the Hon. Mr. CROAL and Mr. JOS. BEETE, Senior.

About this date, the *Courier* newspaper commented strongly upon the alleged "political" tendency of the

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Agricultural Society. The Society's defender was the *Royal Gazette*, which apprehended no harm from its constitution, notwithstanding that it had come into being "at a time and in a place where recent circumstances combine to make every individual who has property at stake a politician to the extent of his ability." The *Gazette* also remarked,

> We certainly in some degree regret its exclusiveness, and would be happy to see its numbers and efficiency augmented by the admission of professional and mercantile men, by which means its objects would also be more extended, and much greater practical benefit ensue than from the limited sphere of its present range.

The writings of the rival journals on the subject of the Agricultural Society were frequently most amusing in respect of warmth and vituperation.

In view of the discussions which recently took place on the financial affairs of the R. A. & C. Society, I may state that at one of the general meetings early in 1834, it was found necessary to pass a regulation that no member after election should be permitted to take his seat until his subscription had been paid, and failure to settle up within three months entailed the expurgation of the member's name from the roll.

Another dinner in connection with the Society was held on the 25th June, 1834, and this is the last gathering of the kind under its auspices of which I can find any record.

There appears to have been a lull in its operations for several months, but at the monthly meeting in September, 1834, the hon. JOHN CROAL in the chair, it is stated that the members present took into "serious consideration" the fact that the agriculture of the colony had been greatly affected by recent events—the allusion,

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of course, being to the great change in the social condition of the labouring population—and there appears to have been agreement as to the desirability of ascertaining the real condition of the agricultural industry, in order "that it may be seen whether any steps have been neglected to be taken by the planters to reconcile the apprentice-labourers to due obedience to the laws." It was accordingly resolved that a series of questions should be put to the several managers of estates, with a view that all who were so disposed might favour the Society with the desired information. This catechism, if I may so term it, comprised thirty-two queries, replies to which were requested by the 27th September. If the answers ever were obtained no public intimation seems to have been made to that effect, and therefore all that it is possible for me to do is to note the matter to the extent I have done. At this meeting on September 3rd, 1834, a model of a self-acting railway was submitted for inspection by the inventor, Mr. DUNCAN MACBEAN, Jnr.

The question of immigration was thus early after the institution of the apprenticeship system, forcing itself forward, but naturally a good many years elapsed before a labour supply could be obtained from abroad upon anything like a proper system. Well, at the last meeting of the Society in 1834, on the 15th December, certain resolutions were adopted with reference to the necessity which the planters were beginning to experience that additional labourers should be brought into the country. These resolutions ran as follows :—

That the Standing Committee of this Society has seen with much pleasure the correspondence of the Right Honourable the Secretary of State for the Colonies relative to His Majesty's Government affording its assistance and co-operation in furnishing the colony with additional

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labourers.

That the Standing Committee do address a memorial to the Honourable Court of Policy, stating, that for the furtherance of the agricultural prosperity of this colony, it is highly necessary that some plan be devised under the sanction and protection of the Legislature, for furnishing it with additional labourers.

That the attention of the Court be called to the fact that no law at present exists whereby contracts between free labourers and masters can be summarily enforced, and that it would, therefore, be attended with considerable risk to individual enterprize were labourers imported into the colony on the mere faith of the former fulfilling their engagement in the absence of any Ordinance to enforce an adherence to them otherwise than by a tedious suit at common law; that it, therefore seems to be necessary as a preliminary measure, that a law embracing the object of encouragement to entering into contracts with the means of promptly enforcing an observance of them, both on the part of the labourers and masters, be passed by the Legislature. The members of this Society being desirous to afford encouragement to the introduction of emigrants of the agricultural class, as soon as they see it likely to be attended with a beneficial effect to the colony. The very fact of the want of an effectual law for enforcing contracts of service operates as a bar to the procuring of free labour even from the population at present in the colony; and the importation of free labourers from any other quarter would consequently, in all probability, only add to the evils already experienced through the want of so necessary an enactment.

That a copy of these resolutions be sent to the Right Honourable the Secretary of State for the Colonies, with a letter from the Standing Committee accompanying the same.

It was subsequently stated in the *Royal Gazette* that on the 1st August, 1835, "the anniversary of that eventful day which so completely changed the nature of colonial society," amongst other Bills which had reached the second reading in the Legislature, was one "to regulate the introduction of articled servants into the colony."

Once more the Society had sunk into obscurity, and the sole item in connection with it to be gleaned from

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the files of 1835, is the bare announcement that it had established a Reading Room, on the 18th October in that year. Strange to say, a single item only is again all that I can gather from the newspapers of the following year, viz :—that on the 10th March, Mr. AND GALLOWAY, the Secretary, invited the Committee, together with such of the ordinary members as might find it convenient to attend, to an inspection of some models of agricultural implements intended to effect a saving of manual labour, the same having been sent out to the Society from the patentees in England. As regards 1837 I find no mention whatever of the Society, and only an incidental reference in the journals of 1838. This was in the Combined Court (the sittings of the Legislature had been thrown open to the public in the previous year) during the consideration of a motion to grant 21,000 guilders to the inventor of a steam-plough upon its being profitably applied to the agriculture of this colony; and it was stated that the Agricultural Society had previously been moving in the matter and that subscriptions had been started under its auspices among the planting body, but its efforts in this direction, the speaker added, seemed to have fallen into abeyance.

BERBICE AGRICULTURAL AND COMMERCIAL SOCIETY.

The movement inaugurated in the capital on the 21st May, 1833, soon extended to the sister county of Berbice. On the 28th December in that year Mr. L. VAN ROSSUM presided over a gathering held in the Colony House, New Amsterdam, at which it was resolved to form an Association for the purpose of protecting and promoting local interests, a Com-

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mittee being appointed composed of the following gentlemen :—

JOHN ALVES, D. C. CAMERON, WM. CAMPBELL, G. P. VAN HOLST, WM. HENERY, THOMAS WILLIAMS, DAVID MELVILLE, DR. TAIT, GEO. LAING, THOS. B. WINTER, and WM. ROSS.

The next meeting was on the 18th January, 1834, when the Society was formally established, "for promoting agricultural matters and encouraging industry among the labouring classes, for supporting the interests of trade, facilitating plans of general utility, and consulting upon any subject affecting the welfare of the community in this district of British Guiana," to be called "The Agricultural and Commercial Society of Berbice." All gentlemen "qualified to vote for Financial Representatives and Keizers and all who pay taxes upon the second (3,500 to 5000 guilders) or upon any higher class of income" were entitled to become members, provided they gave in their names within one month after which new members were to be balloted for, three black balls to exclude. The admission and annual fee of membership was fixed at 22 guilders. The general meetings of this Society were appointed to be held quarterly at the Colony House. The officers chosen for the first year were :—

Chairman, Mr. D. C. CAMERON; Deputy Chairman, Mr. DAVID MELVILLE; Committee, Messrs. WM. HENERY, JOHN ALVES, T. WILLIAMS; Secretary, Mr. THOS. B. WINTER; Treasurer, Mr. GEO. LAING.

On the 28th February, 1834, another meeting took place, at which these resolutions were adopted :—

That it being desirable to abolish the name of Driver, which has long

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been inapplicable, the term Foreman be used instead, and that the members of the Society carry this resolution into effect forthwith upon the estates with which they are connected; also, that it is desirable to provide more efficiently for the education of the labouring classes in this district, and for this purpose to establish on each estate a School at which children six years old and upwards shall be required to attend for two hours every day at least, besides Sundays, and likewise to form a Sunday School for all who desire to attend; that the members of the Society will act upon the above resolution forthwith, and that the Committee be authorised to make arrangements for procuring the requisite books and to distribute them to estates at cost price.

It is to be regretted that the old files of the Demerara papers—I have not had any of the Berbice ones at my command—contain no information with reference to the result of the action which appears to have been resolved upon, or indeed as to whether any such interesting educational experiment was ever actually attempted.

On the 2nd May, 1834, the Berbice Society decided to offer prizes as follows :—

1st. A Gold Medal, value 10 guineas, to any Manager of a sugar estate in this district who should on the 1st May, 1835, have prepared by the plough and successfully established in canes, the greatest extent not less than 20 acres, of land, with the least manual labour; and a Silver Medal value 5 guineas, to the Manager who shall have prepared the next greatest extent in the same manner.

2nd. A Silver Medal, value 3 guineas and the sum of 2 Joes in money, to the best negro ploughman ; and a Silver Medal of the same value to the second best.

3rd. A Silver Medal value 5 guineas to the person exhibiting the best team of 6 draft oxen, in point of strength and docility.

4th. A Gold Medal value 10 guineas to the person who on the 1st May, 1835, shall have effected the greatest saving of manual labour by machinery or otherwise on any one estate in Berbice, to the satisfaction of a Committee to be appointed by the Society.

The next—and the last—reference I have seen to this Society, is an advertisement signed "GEO. LAING, Treasurer," and dated 9th November, 1837, convening a

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meeting of members "to dispose of surplus funds and to take into consideration matters of importance."

WEST COAST AND WEST BANK AGRICULTURAL SOCIETY.

In the newspapers of 1840, mention is made of "The West Coast and West Bank District Agricultural Society", Mr. ROBT. N. BROTHERSON, Secretary.

COLLAPSE OF THE EARLY MOVEMENT.

I have shown how the pioneer Agricultural Societies passed gradually but surely from public notice. The energy and activity with which they were established was not sustained, and in 1841, when "Agricultural Societies or Committees" of an altogether different character were being formed, Mr. ALEX. MACRAE publicly attributed the passing out of existence of the organizations whose records I have endeavoured to collect to the fact that "they had been made the instrument of political squabbles and party feelings." The Agricultural Committees of 1841 were the machinery by means of which the planters sought to bring into operation the historical "Rules and Regulations" anent the work and wages of the freed black people. On October 12th, 1843, the *Royal Gazette*, commenting upon a ploughing match which had taken place in Barbados, remarked :—

Alas for this colony! While the Barbadians are talking of their "District Agricultural Societies" from which such honourable contentions emanate, where, oh planters of Demerara, Essequebo, and Berbice, is the single central Agricultural Association of any sort that you can point to as being now in operation.

Three days later the same paper had the following :—

As to Agricultural Societies, that of the West Coast and River Bank of Demerara was the last to drag its weary existence to a close; since then

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not a word has been breathed of associations of this kind, except a few political essays, as its reports were termed at the time, not a record even is left of its former existence.

Such is the history and such the end of the precursors of the present Royal Agricultural and Commercial Society, whose career must be left for treatment in a future number.

(*To be continued.*)

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After the Storm in St. Vincent.

Edited by Mary E. Browne.

YESTERDAY morning concluded a long letter to you giving a full account of the hurricane, the losses we had sustained by that awful visitation the alarming fires which took place subsequently, and the precautions I took to avoid the occurrence of fire on my own estate. I now propose in justice to ourselves to detail the steps we took for the comfort and relief of the Negroes (even before we thought of ourselves or of our own residences) in order to shew you how we regard the welfare of our people on all occasions. On the evening after the hurricane they were employed by my directions in collecting every article of furniture and clothing they could discover amongst the ruins of their cottages, but as several of these were buried beneath masses of fallen cliffs, it was an occupation of more than a day. The next day, and for a whole fortnight afterwards they had the time entirely to themselves; and whilst some were assisted by the carpenters (who are above 20 in number) in re-building their dwellings, others were occupied in planting provisions, washing their clothes, and clearing away the ruins and fallen trees. The greater proportion of the breadfruit trees had been rooted up, and all were deprived of their fruit, the plantains, which were advancing rapidly to maturity, were all thrown down, and the yams, tanias and other vegetables so seriously injured that we were threatened with a famine unless some immediate steps were taken at this very critical period to avert so awful an addition to our

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sufferings. Flour which had been ten dollars per barrel, rose suddenly to twenty-two dollars, and corn-meal and salt provisions in proportion. But by the seasonable arrival of several American vessels, and the promptness of our excellent Governor in immediately taking off the duties and throwing open the Ports, flour fell as low as seven and a half and eight dollars. We, on our part directed the Negroes to search all their provision grounds, and to secure every article of food they could find. We took the precaution of using first such as would not keep long, and drying or pounding the remainder to come in afterwards. During the succeeding fortnight we gave them three days a week, and allotted to the infirm and aged a portion of one of our own valleys, in which and in their own grounds, they were employed in planting sweet potatoes, Indian corn, peas and ochroes, which are ready in two or three months. When their own little stores began to fail, we bought 40 or 50 barrels of flour, 6 puncheons of corn meal, and an increased number of hogsheads of salt fish, which we served out to them every week in proportion to their respective wants, for which purpose I made an alphabetical list of the whole 700, and made enquiries of all the overseers and drivers as to those persons who stood most in need, affixing marks to their names in order to prevent imposition, which, notwithstanding all our vigilance, we found practised upon us in a variety of instances by those who needed not our assistance, some even having barrels of flour in their houses at the very time they made their application. In addition to these supplies, all the young people under 15, the children, the aged and the sick had each two mugs of chocolate, well sweetened with

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sugar every morning for breakfast, and at noon the same quantity of hasty pudding thickened with salt fish, and these allowances were continued between two or three months. The lists on these occasions were called over by myself or one of my sons every day, and our English servant, ANN, measured it out, otherwise great partiality would have been shewn to particular favourites, and the same person might have come a dozen times, a deceit which they all repeatedly attempted to practise, by washing out their tins and calabashes and coming under a feigned name, though when discovered they were sure to receive a good rap with my stick as a punishment. Notwithstanding all the daily care and attention to their wants I repeatedly heard them exclaim, grumbling as I passed them in the fields, "Massa, me no like hasty pudding and salt fish, me want dumplings and me want salt pork," some wanting one thing and some another. "Oh certainly," I said, in a tone of bitter irony, "and, perhaps, you would have no objection to roast beef, and plum pudding, and mutton chops, and beef steaks"? "Yes Massa, yes Massa, me want dat too." At the very time we were daily administering to their wants and comforts, they were committing depredations upon our canes, for at this early season when they were scarcely ripe, they would seize upon a cane from six to eight feet in length, snap it in two, to taste the middle joint, and if not exactly to their liking they threw it away and broke several more until they met with one more suited to their taste, thus wantonly wasting three or four times as many as they eat. We observed the scattered fragments, and kept a vigilant look-out, but they still frequently eluded us in the

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evenings and at night, when we could not recognise their features, and they were soon hidden and lost among the lofty and thickly-set canes. As soon as the Negro provision grounds were cleared and re-planted, and as many houses erected as we could procure thatch for, (the hurricane having destroyed that upon the canes) so as to allow room for one or two families to occupy each cottage, we left five of the carpenters to continue to rebuild the remainder as fast as materials could be procured, and we turned our attention to our own residences, sugar works and fallen canes. Vegetation in this country is so rapid that the canes and fruit trees soon began to assume their usual livery of green, and apparently to the unpractised eye to recover rapidly from the effects of the storm. In many instances, however, this was only an appearance, for those which looked flourishing at a distance, on a nearer and closer inspection were found to be withering and rotting on the stalks, sprouting at the eyes, or taking root where they had fallen, all which contribute not only to diminish the quantity but seriously to deteriorate from the quality of the juice. Some were so much injured that they could not be raised up at all without snapping off, others that would admit of it were gently supported, stripped, weeded and bedded with trash, and the later canes which were not so high at the time all weeded, hoed up and manured. This was the occupation of several months, as great care was required in their injured state, and a profusion of weeds was threatening to grow through them as in the case of laid wheat in England.

In the meantime our jobbers were employed in removing the fallen trees and rubbish, collecting the scattered

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materials and preparing the way for the masons and carpenters, who commenced with putting my house and the manager's in a barely habitable state. Then we proceeded in due order to the mill-house, boiling house, still house, and the canal. The latter, from its great extent, four or five miles, passing round wooded hills and under precipices, was so filled up with rocks, masses of fallen earth and immense trees, that it was a labour of some time to clear it out effectually. On the first of September our own residence was rendered so far habitable that we were enabled to return to it from the curing-house, where we had passed many weeks of discomfort under a burning coppered roof, and in the midst of the various disagreeables with which it and the store room are usually filled. We were returning it is true to a mere thatched cottage, but the temperature was so different, and the air so pure and comparatively cool, that it was quite a luxurious palace compared with the building we had quitted. We had abused it before the hurricane as little better than a barn, but we were now thankful, nay delighted, to occupy it again, even in its diminutive and reduced size. The very next morning we had a visit from Sir GEORGE HILL, the Governor, who with his characteristic benevolence and zeal for the public, had come up attended by only a single servant, knowing how incapable we were in this part of the country of receiving him with any retinue. His object was to ascertain by personal observation the extent of the calamity that had befallen us, in order that he might represent our case in stronger terms to the Government at home, and describe as an eye-witness the extent of the loss we had suffered. Not aware of any such intention I had

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ridden to inspect the repairs that were going on at the Tunnel Wharf at Mount Young, and on my return observed as I thought a stranger standing on the ruins of our works at Mount Young, and looking with uplifted hands and in utter astonishment at the prodigious violence of the wind which had not only hurled away the roof in fragments to a distance, but had thrown down the very stone walls. It was our worthy friend Sir GEORGE, who observed on recognising me, that all the accounts he had received in town of the state of the Carib Country, and which he concluded would be much exaggerated by our fears, fell far,—very far short of the reality; for that beggared all description. As we rode along I pointed out to him the prostrated fields of canes. trees of the largest size, thrown across the roads, and our ruined buildings at Grand Sable. From thence we rode up to our little cottage at which the workmen were still engaged, and I introduced him to the ladies in our little drawing room, which was now merely a little open gallery. After congratulating us upon our personal safety. though commiserating our misfortunes, our guest was soon quietly seated amidst shavings and lumber, quite at home. He made us recount to him all the perils and adventures of that awful day, traced our flight from room to room as the building fell, our escape through the window, lodgment in a pantry without windows or doors or floor, and our final refuge in the ever memorable cave, the interior of which we explored. Afterwards as we passed along the cane fields where the negroes were at work, I requested them all to take off their hats as a mark of respect to His Excellency. Some of them remarked to me afterwards "Massa, how plain Guvnor

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dress, and how free to talk to every body, we no bin know he come till you tell us. When last Guvnor come me know long before he reach Grand Sable; him dress out all over so fine, him soldiers wid him, drum beating, flags flying, him all so grand." On his progress northward to visit the other estates, I accompanied Sir GEORGE across our own boundaries and through the neighbouring properties of mount Bentinck and Langley Park until he reached the road leading up to Lot 14, Mr. CUMMINGS' residence, which, as it had sustained the least injury from the hurricane would best admit of his reception; and there, several gentlemen of the neighbourhood and amongst them myself paid our personal respects next morning. The following week the Governor occupied in a similar tour to the leeward side of the island, and from his own observation and strong representations of our desolate situation, accompanied by the estimate of losses made out by the Commissioners he had appointed for that purpose, we may mainly attribute the £20,000, which has been awarded by Parliament to this island. The estimated loss sustained on the whole island was about £200,000 and our own individual loss at a moderate calculation £10,863 18s. so that our proportion of the grant will, at 8 per cent be about £869. Small however as this sum is when compared with our actual loss, we shall find it in these times a most seasonable relief and of considerable service to us in our reduced circumstances. I have great reason to be thankful that we have not had the same expenses to incur in repairs at Grand Sable as many of our neighbours on the adjoining estates, who were obliged to hire tradesmen at very high wages, there being so much competition,

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whilst we have erected our works, and shall complete every other building with our own tradesmen alone, without hiring one stranger, carpenter, blacksmith, or mason. Our principal expense in cash will be for the materials, wood, lime, tiles and iron, and the increased supply of provisions procured for the negroes. Our principal fields and sugar works being at Grand Sable, our first attention was directed to them, and by very great and continued exertions those works were so far completed by the 28th of November, that we commenced cutting canes on that day and grinding and boiling on the 30th. It was a most anxious time, for from the injury the canes we were cutting had suffered during the hurricane, and their progressive deterioration every week by remaining on the ground so long, we anticipated from our early canes nothing but molasses. As the liquor advanced from copper to copper, seven in number, we watched its progress with an anxious eye; it at last reached the teach or last copper, where its boiling is completed and from whence it is struck into the coolers. All our neighbours were anxious to know the result as we were the first to commence crop, for on our fate depended their own. What will it turn to? Molasses only I fear. Now it looks better—it will surely granulate! It is struck into the cooler, as the heat lessens it assumes more consistency,—the grains become visible—it is sugar! Then as to its quality; (when removed from the cooler and packed in the hogshead, where it parts with the molasses and is cured ready for shipping) that is far better than we calculated upon; and as we advanced in our crops it grew better and better, up to the present time (April) at which period we are actually making

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finer sugar both in grain and colour than was ever produced on this estate before. Had the hurricane then improved the quality of these latter canes, you will ask? No, but the improvement is owing, first, to these canes having been better attended to, than they had been for years, in weeding hoeing and manuring, and, secondly, and in my opinion mainly attributable to the very improved method of potting the sugar, which I adopted at the suggestion of a very intelligent gentleman, Mr. MASSIAH of Barbados.

The Sunday after the boiling house was re-opened I had it fitted up at one o'clock with benches, and recommenced Divine service for the negroes. The morning service I have performed in my own house for the family and such as chose to attend. These desirable objects attained and our main buildings erected, we proceeded to re-build our megass houses (where the cane stalks when the juice is expressed are dried for fuel) our coopers' and carpenters' shop, our boat house at the Tunnel and the home cattle pens. Our attention would have next been turned to the erection of our hospital, nursery, overseers' houses, and my own mansion, but as American lumber, deal planks and scantling, is at present very high, we must wait a favourable opportunity when the price is low, and in the meantime our carpenters, to save expense in every way, are engaged back in the woods in cutting down large trees, which they split up into headings for the sugar hogsheads.

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Report of the Meetings of the Society.

Report of the Meeting held 8th July.—The Hon. W. Russell, President, in the chair.

There were 17 members present.

Election.—Henry Messervy, Pln. *La Bonne Intention*, was elected an ordinary member.

Mr. Garnett gave notice of motion that the subscription of members be reduced.

The President said he would submit some data to the next meeting on the Slicing of Canes, in connection with the Diffusion process.

Some information from Mr. Walker, Director in London, was laid before members. He said he had been in communication with Mr. Stanford, the publisher, about a qualified person to arrange the Society's proposed classified catalogue of books.—The invoice of medals for the Local Exhibition amounted to £110 16 8.—Mr. Walker expressed his satisfaction at the colony's display in the London Exhibition—He thought the establishment of a Colonial Museum in London was now assured. He had on enquiry learnt that there was no prospect of a dividend from Ridgway's estate for at least six months longer.

In reply to Mr. Hutchens, the Honorary Secretary said the memorial bust of Mr. Campbell was in course of execution.

A letter from Mr. Hawtayne, Commissioner at the Exhibition was read, accompanying a pamphlet on the Locust war in Cyprus, and containing information about

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a new process for preserving the natural appearance of fruit, by a mixture of Hydrate chloral and water.

On the suggestion of the President, Mr. Quelch the Curator was asked to make experiments on the preservation of native fruits in the manner suggested.

A request communicated through Mr. Hawtayne from Mr. James Jackson, Fellow of the Paris Geographical Society, for maps, plans and publications relating to the Colony was favourably entertained, provided his society was willing to arrange exchanges. In this connection Mr. Hutchens expressed his willingness to supply a list of a most complete collection at the Hague, of maps, plans and papers relating to this colony.

Mr. Williams, acting Government Analytical Chemist, submitted a tabular statement of analysis of several varieties of Jamaica canes made by the Chemical bureau of the U. S. Department of Agriculture. He was accorded a vote of thanks.

The President said the next item of business was discussion on his paper on Cattle raising in the Grand Savannah, Berbice. The fact that the colony had to import cattle from other lands, while it had such excellent means of raising its own flocks, was a very important one, and showed the want of enterprise somewhere.

In the short desultory conversation that ensued, in which Messrs. Hutchens, Jamieson, Garnett, Winter and Hill took part, Mr. Godfrey pointed out that it was drainage that was wanted in the first place to ensure the success of a cattle farm in this colony. In the dry season there was no water, and only sunburnt grass, and in the wet season the water drowned the small stock and killed the horses.

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After attention had been called to the possibility of supplying cattle districts with water under a Government scheme, and taxing the lands participating therein, for the same, it was understood that a copy of Mr. Russell's paper should be sent to the Government.

Referring to specimens of striped Sugar Cane exhibited at a previous meeting, Mr. Kirke drew attention to a recently published letter on the subject from Mr. Thisleton Dyer of Kew. The President promised further information on the subject.

The President's paper on Rice Cultivation in the colony, read at a previous meeting, was next brought up. At the close of a short discussion in which Messrs. Kirke, Hutchens and Godfrey took part, the President stated that on the suggestion of Mr. John Imlach he had sent an order to Carolina for fresh seed, which he hoped soon to be in possession of. He added that there was scarcely a part of the colony that was not fit for rice cultivation, or that could not easily be rendered so. The cultivation of rice was rapidly extending. It offered a splendid occupation for young men of energy not afraid of hard work.

On the motion of Mr. Hutchens, seconded by Mr. Garnett, a hearty vote of thanks was accorded to Mr. Russell for his two papers on such practical subjects; and regret was expressed that there was not a larger attendance of planters present to discuss them.

The meeting then closed.

Report of the Meeting held 12th August.—The Hon. W. Russell, President, in the chair.

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There were over 50 members present.

Election.—*Member :* P. B. Kearns, Pln. *Success*, East Coast, was elected an ordinary member.

Mr. M. Garnett brought forward his motion, that the annual subscription should be reduced. In the course of an animated speech he said :—The present was a fitting time for a reduction in subscriptions. Not only does the present subscription, in these days of strict personal economy, retrenchment, and reduction of salaries, press heavily upon many members ; but was it right in a country such as this, possessed of neither a free library nor other place of reference, that the high subscription of the Royal Agricultural and Commercial Society should prevent many from enjoying that which in every other country would be offered them gratuitously ? He believed that the proposed reduction of subscriptions would have the effect of largely increasing the list of members, and an increase of members ought to add to the interest taken in the Society, and perhaps check the cursed apathy and spirit of indifference which is so gradually but surely stealing over the community in general, and the Royal Agricultural and Commercial Society in particular. He concluded by moving that the subscription of ordinary members be reduced from $16 to $10— town and country alike—and of associates, from $8 to $5.

Mr. Nind seconded the motion and advocated the cheapening of libraries as a means of educating the people.

Archdeacon Austin, Mr. Hutchens. Mr. Braud, Mr. Kirke, Mr. Winter, Mr. Hodgson, the Secretary, Mr. Daly and Mr. Darnell Davis, took part in the discussion ;

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and on the last named member, who supported the motion, pointing out that Mr. Garnett's motion, under the rules of the Society, ought to have come before a general meeting (of which October would be the first), and the President having so ruled on a question of order, Mr. Garnett at once withdrew it, to bring it up at the right time.

In the course of the discussion it was announced that the arrears of subscriptions amounted to nearly $5,000 and that the rules of the Society as regards arrears had been allowed to fall into abeyance.

Mr. Quelch, Curator of the Museum, reported the following recent additions to the collection :—

1. Throat pouch, or vocal drum of red howler, or baboon. It forms a deep pouch in connection with the larynx, the vocal part of the windpipe, into which the air sack dips, so as to form a large resonant chamber, and the sound emitted is more like the roar of a lion than the cry of an ordinary monkey. It may be compared to an organ pipe. it is not so fully developed in any other of the animal kingdom.

2. Marsupium, or brood pouch of the Awarie. It is formed by a folding of the skin around the nipples into which the young are placed by the mother. The awarie belongs to the kangaroo tribe. It is an opossum, and with one exception—the opossum of the United States—all the allies of the awarie are to be found in Australia.

3. A curve bill creeper, presented by Mr. James Winter, and found at Massaruni. The bill may be compared to the form of a bill found in the sickle humming bird in an exaggerated condition. The tail is like the woodpecker's, stiff and sharp, giving support to the bird on the trunks of trees when searching for food, which it can get by means of its long curved-bill from the crevices of the bark. It is the first one found here, and is not mentioned in the list of birds of British Guiana published by Salvin.

4. Tarantula spider, with dissection showing the poison glands and fang, the insertion of muscles which move it backwards and forwards and also the nerves which control the muscles. The fact of its being bird-eating is fully established.

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5. Leaf insect, allied to the locusts, presented by Mr. James Winter, and from the Massaruni. The anterior wings are perfectly leaf-like in colour and form, the colour assimilating that of a leaf in process of decay,—a fading leaf bearing a large central vein, lateral reticulate veins, and brownish spots. When at rest, the hinder wings are folded together as in a fan, with the anterior wings laid upon them, so that to its enemy a pair of leaves alone is to be seen and not an insect.

6. Lantern fly, Guiana, presented by Mr. G. S. Jenman. The front portion of head is immensely produced to form a thick proboscis, which is said to be phosphorescent. This luminosity though is open to doubt. Certain travellers have kept them in captivity with no experience of their luminosity, but Madame Marion in her account of the insects of Surinam states that she observed it, and that it was almost enough to allow one to read. It is allied to the six o'clock beetle.

7. Specimen of the common migratory locust of central Europe, Cyprus locust, Berbice locusts male and female and Venezuela locusts. The Berbice and Venezuela locusts appear to belong to the same genus as the United States species. Remedy must depend upon their abundance and the kind of country in which they are found. In Cyprus they are exterminated by means of an arrangement of screens and pits, and in the United States by means of tanks of kerosine and coal tar. Egg collection has also been combined in both cases, though not satisfactorily.

8. Live specimens of a very ancient and remarkable type of life.—Peripatus, a worm-like, or caterpillar-like animal, slightly ringed with lateral feet and two snail-like feelers, or antennæ. The nervous system is a remarkable ancient type intermediate between the lowest worms and the insect group. The respiratory system is by air tubes, which open irregularly over the body not as in other tracteate animals along the side of the body by special pores. The development of this type of life is at present not well known. It is to be found in decaying wood in moist positions. The specimens exhibited were found in the Pomeroon district, where they were previously obtained by Mr. im Thurn. Other specimens have been obtained in the Hoorabea creek.

Regarding the preservation of the natural appearance of fruit, as suggested by Mr. Hawtayne, Mr. Quelch exhibited the results of experiments he had been making with various preserving liquids, and asked for further

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time to continue the experiments, none of the present results being entirely satisfactory.

The President read a paper on the Slicing of canes and Diffusion, in which he said experiments had shewn him that it was a loss to reduce cane to small dimensions before subjecting it to the crushing mills. He believed in the future of the diffusion process.

The President laid over a few hybrid canes found on Pln. Greenfield, which were ordered to be handed to Mr. Jenman for experiment and report.

A letter from Mr. Walker, the Society's Resident Director in London, dated 14th July, dealing with the cataloguing of the books in the library, was referred to the Book Committee.

A letter was read from Mr. John McKillop, of Tobago, tendering his thanks for having been elected an honorary member of the Society.

The thanks of the Society were accorded to the Government Secretary of British Guiana and the Trustees of the British Museum for contributions of books, Statistical Tables and Commercial Reports.

The meeting then terminated.

Cane Slicing and Diffusion.—The following is the President's paper on the above subject read at the August meeting:—

Since Mr. Matthey read his highly instructive paper on diffusion as applied to the sugar cane, there has been a considerable amount of inquiry into the subject, including a visit from Mr. Shulz, the able agent of an enterprising German firm of engineers, whose headquarters

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are in Sangerhausen, and who have had very great experience in the most approved system of extracting sugar from the beet. That visit has, I am glad to inform members, resulted in a contract to furnish a complete diffusion plant for Mr. Hogg, to be erected and worked by specialists from Germany ; so that before another 6 months are over our heads, I hope diffusion may be added to the many successful improvements which have marked the advance of our main industry.

As the question of slicing has given rise to the idea of its being the right thing to adopt for preparing canes for a mill, my friend Mr. McConnell, through Messrs. Aitken McNeil & Co., has sent me an improved slicing machine somewhat on the lines of those at work in Aska Works, Madras, and I have it erected at Uitvlugt for experimental purposes. The machine is vertical with a heavy faced wheel, 6 feet in diameter for holding the cutting knives. Motion is given to it by the same engine which works the dynamo for electric lighting, and which works up to 14·1 H P. In a trial, working the slicing machine, this engine exerted 7·1 H.P. cutting 2 tons of canes per hour, into most suitable chips for diffusing, thus; for 12 tons of canes calculated to make a ton of sugar by diffusion process, this represents 42.6 H.P. or just half the power called for to crush a similar quantity of canes by mill, extraction being 63 per cent. of juice from the weight of the canes representing 2,000 pounds of sugar.

To feed the machine kept a man hard at work feeding while the canes were placed to his hand. This is almost exactly the same man power as is required to throw canes on to a cane carrier, so that with our water carriage, I estimate that a slicing machine will call for double the

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manual power now used for feeding mills. In India or the islands where the canes are brought in bullock carts it would be different, as a man could handle the canes from the cart direct into the machine. Everything else being equal, this tells seriously against our much vaunted water carriage.

Mr. Owen Alexander in writing me from the U.S., strongly recommends the cane chips being passed through a mill, when he thinks the extraction would possibly reach 80 per cent., and if so it might be found more profitable to stop at this stage, and so utilize the spent chips as fuel and reduce the quantity of water of evaporation in carrying out the full diffusion process. Following up this recommendation, the chips were carefully fed through the mill with a ton and quarter on the hydraulic bearings, and while the chips came through like sawdust, strange to say they were quite damp, and it was observed that the run of juice was very small indeed, indicating about 58 o/o of the weight of the chips against 65 o/o grinding canes. At first sight this was a puzzle, but on looking more closely into the operation it became manifest that the tight block of chips that were forced up against the peripheries of the top and back rollers left no space for the juice to escape, consequently when the chips came into contact with the final grip, the result was that the juice simply rolled along with the chips, being absorbed by them on the delivery side.

This important behaviour of canes reduced to shavings in passing through a three-roller mill strengthens an opinion I have long held regarding the absorption of juice when a slow heavy feed is passed through one of our large mills, and of which I shall have something to

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say later on, after I have had time to verify trials on a large scale.

The Uitvlugt experiment is quite sufficient to prove that there is no gain, but an actual loss, in reducing canes to fine dimensions before undergoing pressure in one of our ordinary rolling mills.

Report of the Meeting, held 9th September.—The Hon. W. Russell, President, in the chair.

There were 20 members present.

Election.—*Member:* The Rev. A. C. Pringle was elected an ordinary member.

The appointment of Mr. F. A. Conyers (in the room of Mr. Bugle, left the colony) as Hony. Treasurer, to act until Mr. Imlach's return, was notified and approved.

Mr. Kelly referring to the Locust Commission, of which he had been appointed a member, explained that he had not visited Berbice along with Mr. Russell and Mr. Quelch, the other two commissioners, solely because he had received no official intimation of the Directors having appointed him. The first communication he received was when he was on board the steamer on his way to Essequebo. He wished to explain the matter to show that he meant no discourtesy to the directorate. The Secretary and President explained how the Commission was appointed, and had left for Berbice before it was possible to communicate with Mr. Kelly, who at the time was out of town.

The President moved the election of Colonel Figyelmesy, American Consul, as an honorary member. The Consul had furnished the Society with very valuable reports from the Agricultural bureau of his country,

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and had at all times taken a special interest in strengthening the commercial bonds between the States and this colony. The appointment was unanimously adopted.

A letter from the Government Secretary, thanking the Society for affording the Government the benefit of Mr. Quelch's services in the Locust enquiry, was read. The report of the Commissioners was laid over as follows:—

THE LOCUSTS IN BERBICE.

Report on a Journey to Berbice to examine the Locust Visitation.

Sir,—Agreeable with the desire of His Excellency the Governor, as transmitted to us by the Secretary of the Royal Agricultural and Commercial Society, that an enquiry should be made into the present locust visitation in Berbice,

We have now to report that we (our colleague Mr. R. J. Kelly being unavoidably absent in Essequebo, whither he had departed previous to the constitution of the Committee of Inquiry) left Georgetown overland to Berbice on Wednesday morning (August 25th), and arrived at Rose Hall on the same afternoon. We found that nothing had been seen of the locusts in this locality. On Thursday morning, in company with the manager, we rode all over the plantation, which embraces a considerable area of country extending almost to the Corentyne public road, and in all that ride we saw neither locusts nor traces of their ravages. Later in the day we drove to Friends, calling in on the way at Everton, where we found that locusts had been plentiful in the provision grounds. Mr. Welchman of Everton kindly showed us over the provision grounds close to the labourers' dwellings, where great damage had been done. The locusts had decreased in number to a very great extent; many dead and sickly ones were scattered over the grounds, and the larger number of the living ones proved to be males. Very few young ones had as yet been seen; and the canes had not suffered. At Friends the condition of things was much worse, for not only had the provision grounds been greatly damaged, but the canes also had suffered to some extent, while young locusts were rapidly hatching. As it was too late in the day then to examine this state of things, we arranged with Mr. Hunter to return on the following Monday. On the way back we were informed by Mr. J. Gray of the Public Works that he had seen swarms of locusts swimming across the Berbice river, but this we had no opportunity of witnessing.

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On Friday morning we drove along the right bank of the Canje. At an abandoned plantation, called Speculation, now planted in patches with provisions, we found decided marks of depredation by locusts. The insects, which were chiefly males were in a sickly condition. Maize and cassava were the plants which had suffered most. The maize plants presented quite a withered aspect, the mid rib of the leaves being alone left; while the cassava, which had also been stripped of their leaves were crowned by a rosette of young leaves which had since sprouted. We were informed that this destruction of the cassava leaves quite spoiled the roots for food, owing to the absence of the starch, and that this condition was rendered still worse by the re-growth of the young leaves.

The road through this district of abandoned estates is surrounded on both sides by a second growth of indigenous plants with patches of ground provisions and plantains, and though the locusts had done great damage in the district, yet it was not unusual to find, interspersed among the woods and grass, patches of cassava and maize which had escaped injury. At Bachelor's Adventure we met an intelligent African who gave a very minute description of the appearance of the insects, of their pairing, and of the egg deposition in soft pegassy land from which he had turned them up in quantities.

Arrived at Port Mourant shipping house, at Vrieden Vriend Schap, where the watchman has a very fine and isolated provision garden, we could find no traces of locusts; nor did we meet with any in the course of our ride along the shipping canal right through to the sea margin on the Corentyne Coast.

On Saturday we rode about the plantation and made enquiries as to the visitation of the locust to the Coast districts. We were told that they were to be found at Good Hope, higher up the coast, and on to Skeldon; but, from specimens brought us by Dr. Massiah from Good Hope, it turned out that the locusts of that district were of a different kind and of a much greater size. They are common in these districts and they had previously been seen by one of us (Mr. Russell) in various stages of development along the sandy lands embracing the mouth of the Corentyne River; and, from what we have been able to learn, these insects feed upon forest trees and cocoanut palms. We were not able to ascertain that they attacked the provisions. Mr. Reid, in a recent letter to the *Daily Chronicle*, evidently alludes to this same insect, and it might be well to verify what is stated of its habits.

On Sunday we returned to the Canje, and with the estate's launch

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steamed down to Philadelphia, on the left bank of the Canje, where, we had been told, the locusts had done great damage. The lands of this old sugar estate which is rented out by a number of Africans and coolies, have been much more efficiently cultivated than those on the right bank of the creek immediately opposite, viz., Goodland, and the locusts have done much more destruction in them. The maize and cassava have been completely stripped over large areas, the former being reduced to dry stems and midribs, the latter to long sticks, in many cases denuded of bark and not crowned by the more usually occurring regrowth of young leaves. Locusts of the old stock, chiefly males, were hopping about in considerable numbers—but they seemed in a sickly condition. Dead insects of both sexes strewed the ground in a dried up state; very few shewed any marks of having been destroyed by ants or other enemies. The young insects had already begun to hatch throughout the plantations; and on the lower section of the estate we found them in swarms, covering indiscriminately all green matter and, in many parts resting on the ground or dried leaves and fallen timber. When disturbed they rose by short hops and produced a sound like falling rain.

They seemed very gregarious, and completely to cover the object on which they settled. The leaves of the young plantains which touch, or are close to the ground, are readily attacked, and the young trumpet trees seemed to be particularly attractive. Objects on or close to the ground are much more liable to be attacked by the very young locusts.

The eggs were found in astonishing quantities and in fact formed the chief part in the cassava heaps in different parts. When the total number has been hatched the ground will literally be covered by them. The people had made no attempt to destroy either the locusts or the eggs—the coolies accustomed to such visitations in their own country, appear to attach very little importance to the subject. The rice had apparently not suffered at all. The cleared land and cultivated district of Philadelphia, amid the surrounding woods, had offered peculiar advantages to the locusts, and these had been readily seized by them.

We returned to *Rose Hall* on Sunday evening. On Monday morning we started early for *Friends* to examine into what we heard of on the Thursday previous. In company with Mr. Hunter, we rode through a high mora reef with very stiff and hard soil to the provision grounds at the back, where some abandoned canefields had been taken up by the labourers and had been planted out with the usual kinds of

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provisions common to these gardens, such as maize, cassava, plantains, yams, tannias, etc. We found the old locusts in actual flocks which hopped away before us into the grass and weeds, in the cross sucker drains and into adjoining beds of indigenous bush growth. The larger proportion of these live ones were males, and many of them were paired off with females, nor did they separate except to escape capture. A few sickly ones lay on the ground, but the generality of the live ones were quite healthy and the females dissected were provided with eggs. Pairing and egg-depositions are thus not yet completed. Several dead specimens lay on the ground, but these, as at Philadelphia, seem to have died naturally or have been killed by disease—rarely were they in a condition as though eaten by ants. On proceeding into the parts of the field where newly-hatched insects had been observed, we found a condition similar to that at Philadelphia—and perhaps worse. The young locusts swarmed over the place and were heaped together in parts in great masses like so many large bunches. The small drains which are covered with bizzy-bizzy and other grasses were simply alive with them. The eggs were being rapidly hatched; and the vegetation that the original locusts had spared but waited the attacks of the growing brood. Large numbers of the young ones were being destroyed by sweeping them from their perches by means of a ladle of ignited parafine into which they fell and were burned. A few stray canes springing from abandoned shoots shewed traces of the injury by the old locusts and several of the shoots were now infested by the young ones. The maize, cassava, plantains, etc. were as at *Philadelphia*.

Riding down to No. 15 where the locusts had first appeared, we found several old insects feeding upon vegetation in the fields—several dead ones lay about. Many of the canes shewed instances of locust injury, the leaves being reduced to midrib. Eggs were present in large numbers, and the young ones were being hatched and were taking up positions on the leaves of the canes, in several places in large swarms. It seemed that the canes would necessarily suffer, for although the adult locusts had forsaken the canes for the provisions, yet these young ones would have nothing else to subsist on, at least until the winged state was reached. The young locusts were evidently just beginning to hatch over the locust area, being of a pale green colour, rapidly changing to a dark brownish green and spotted with age. They are then about half-an-inch in length, and wingless. The wings are developed after several months, before reaching the perfect state.

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Before leaving *Friends* we were waited upon by several farmers who hold land between *Friends* and *Highbury* and all had the same pitiful tale. The condition of their provision grounds was as at *Friends*, *Philadelphia*, etc., and the young were rapidly increasing. They apparently expected payment for the damage done, and yet by their own confession had attempted in no way to lessen the injury.

After leaving *Friends* we called in at *Providence*, and Mr. Bullock informed us that the locusts were in the provisions grounds as in the other parts of the locust area, but as yet no injury had been done to canes. He mentioned having seen the locusts on wing flying high, and against the sea-breeze.

Mr. Evans of *Ma Retraite* reports them on that estate, but as yet no damage to canes.

Dr. Corner informed us that the locusts were not at *Highbury*, but this evidently refers to the canefields, since the farmers report the injury done to their provisions.

On Tuesday we returned to Georgetown by steamer, having met Mr. Kelly the day previous in New Amsterdam on his arrival by the steamer.

It is thus seen that we can confirm in detail the graphic account previously given by Mr. Huuter of the locust visitation and which has since been published. The provision lands have suffered considerably, and in some cases have been practically destroyed as regards the present crop. Worse is to be feared from the young ones which will be much more numerous than the old locusts, unless some attempt be made to destroy them or lessen their numbers.

The canes which suffered but little real harm from the old locusts, may suffer from the young ones and most likely will do so in those cases where the eggs have been deposited in the canefields in which the young will hatch out, and feed—at least until their wings are developed. This has happened to a certainty at *Friends*, as we have since heard, on Mr. Hunter's authority.

A noteworthy fact is the almost entire absence in the locust area of special enemies to the locusts. We saw no instances of birds eating or preying on them, and no case of other insects or grubs feeding upon them. A solitary ant was once observed carrying the body of a young locust.

A striking feature in the locust area is the apathy of the farmers whose provision grounds are being destroyed. They have made no

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attempt to catch any locusts nor to destroy the eggs. If a live locust be taken up by them, they will again drop it down alive, though their crops are suffering from the ravages of the insects. They, in answer to a recommendation to destroy at least some of the locusts, shake their heads and answer that they might as well attempt to kill mosquitoes—though individual insects are not hard to catch and the eggs are easily found. A more pertinent answer was sometimes given when they replied that their crops being destroyed, how were they to live if they spent their time catching locusts for nothing. Yet they and their families in their spare time might do a great deal in destroying the insects and eggs.

From the special nature of the country, it is a difficult matter satisfactorily to deal with these locust to lessen their numbers. To exterminate them altogether seems to be out of the question when it is taken into consideration how much woody lands and abandoned plantations and open savannahs give refuge to the insects. They might, however, be rooted out in the course of time by persistent effort.

From the wide extent of country and the small and scattered population, it seems useless to attempt the system of enforced labour, such as was enforced during the locust plague in the United States. A good deal might be done on the estates by enforcing the destruction on all their lands, of the insects and their eggs. Combined action in this case is necessary, for one estate or plantation neglected becomes a breeding and supply ground for the others about them.

Harrowing or turning up the earth in which the eggs are deposited, which has been beneficial in cold climates, has not here been of any or much service, since the increased temperature from the exposure to the sun seems only to quicken the hatching of the eggs.

This might, however, be useful when the eggs are freshly laid. Deep ploughing in the special cases can scarcely be recommended; and from the small extent of country over which trapping engines and screens, such as have been made use of in the United States and in Cyprus, could be easily worked, there is little promise that they would repay their expense. Large and shallow trays of kerosine and coal-tar such as were used in the States, are not fitted for use in the canefields and plantations; and canvas soaked in kerosine, as also used in the States, gives but little satisfaction—as judged by experiments on a small scale at "Friends."

A modification of the coal-tar trays and canvas-screens, as used by Mr.

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Hunter at "Friends," gives excellent results and is to be strongly recommended. Screens of canvas, of the shape best suited to the vegetation to be protected, to be covered with tar and brushed up against or in the way of the young locusts. When the tar is covered over with the young ones, a fresh layer to be laid over it. Screens of convenient size to be used, with handles by which they can be easily manipulated—from 4 to 6 feet in length, not counting the handles, and from 2 to 4 feet in width.

As both young and adult locusts tend to congregate about their food plants which fall on the ground, heaps of cassava and maize may be made in the fields and plantations, and these heaps be treated with the screens or be surrounded with fuel and burnt when covered by locusts, and these may be usefully sprinkled with a mixture of one part arsenic by weight, 1 of sugar or molasses, and 5 of bran, made to a thin paste with water. This poison which was used in the vineyards of the United States for locusts ought to be useful for the winged insects.

To supplement methods, it seems advisable for the Government to offer a reward of 2s. a gallon for young locusts and eggs, separately or mixed, and 6d. a gallon for the winged forms, to be paid by the managers of estates such as Mara, Ma Retraite, Highbury, Friends, Providence, Rose Hall, and Adelphi on the authority of the State.

Signed, W. RUSSELL,
JOHN J. QUELCH.

In the course of a short conversation on the subject, Mr. Kelly mentioned having received a letter from Pln. *Friends*, Berbice, telling him that the labourers were now industriously engaged in the locust collection, and that $240 had been paid to them within two or three days, and that about $800 would be required for the current week's collection. The President said that that amount of money represented the collection of 1,600 gallons of locusts,—which would give the public some idea of the great extent of the pest.

Mr. Kirke, the Vice-President, narrated his experience of locusts in the north-west provinces of India, where they

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came and went with certain winds and were looked upon simply as an ordinary visitation.

Mr. Quelch exhibited specimens of the Berbice locusts in various stages from the egg to the fully developed insect, and referring to their rapid growth suggested that the rewards first offered for their collection by measure, might be modified accordingly. This however was considered unadvisable at present.

The President stated that Mr. Jenman, Government Botanist, had planted in the gardens the hybrid canes submitted at the Society's last meeting, and would watch their development, and report in due course. Mr. Monkhouse, Pln. *Providence*, said, Mr. Douglas, chemist of Pln. *Diamond*, was preparing a paper for the Society on the different varieties of canes, which he hoped to bring forward at the next meeting.

The acting Treasurer laid over statements of the financial affairs of the Society,—showing its funds, also its income and its probable expenditure the latter well within the former. These statements were ordered to be published for the information of members pending Mr. Garnett's motion for reduction of subscription.

Several communications from Mr. Hawtayne, C.M.G. one of the Commissioners at the Colonial Exhibition, were read, bearing on certain Minor Industries; notably flower cultivation for perfumery purposes, the development of plants useful in medicine, and a possible trade in walking sticks. He also forwarded specimens of small articles, pipes, studs, &c., made from native seeds and sold at the exhibition.

In a letter dated 10th August, Mr. Walker noted a

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payment of £3 13: 10 by Mr. Stanford, as credit balance for sales of *Timehri* to 30th June.

Mr. Wiley, Chemist to the United States department of Agriculture, forwarded reports of the Chemistry division, and asked for an exchange of the Society's Journal. The thanks of the meeting were awarded him, and his name added to the *Timehri* list.

A letter from Ellis Barton, "native expert sugar chemist and sugar manufacturer" was read, asking the Society's help towards patenting his invention of a "compound steam percolator and cane-juice extraction mill." The assistance could not be granted, there being no funds of the Society available for such purpose.

A letter from the London Chamber of Commerce in reference to a proposed establishment of Commercial Museums in the United Kingdom was taken for notification, pending receipt of further information promised after a visit of inspection to similar institutions on the Continent.

The thanks of the Society were accorded to Colonel Figyelmesy for a presentation copy of "The Report of the U. S. Department of Agriculture for 1885."

The meeting then terminated.

Meeting held 14th October.—The Hon. W. Russell, President in the chair.

There were 58 members present.

Election.—Member: Mr. W. Morison, Goedverwagting, was elected a member.

Mr. Conyers laid over a statement of the accounts to the 30th September shewing a credit balance of $2,380 78

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audited by Mr. Kelly and Mr. Pitman ; also a statement and recapitulation of the subscriptions paid and in arrear.

In answer to Mr. Garnett, the Secretary said the amount of arrears in August was $5,278, now, according to this statement, reduced to $3,680. On looking through the list, however, he found a good many names that might have been struck off long ago—some of them were dead and others had left the colony—so that he thought the most practical way to deal with the list would be to appoint a Committee to weed out the hopeless names, and take proceedings against those in arrears who could be got at.

Mr. Braud moved that the Secretary be instructed to strike off the names of all the dead members and those who had left the colony for good, and that the list as amended be handed over to a lawyer for the collection of the arrears.

Mr. Cameron seconded the proposition which was carried.

The President said that before proceeding to the order of business he wished to refer to the matter of *Timehri*, the Society's Journal and to enquire what connection there was between the Society's Journal and the Society from a financial point of view? He saw from the accounts that an amount of $500 had been paid to the publisher from the Society's funds.

The acting Treasurer, Mr. Conyers, said he could get no information about it from the publisher beyond the fact that this amount, (which had been paid before he took charge of the accounts) was an advance to meet the cost of publication of the Journal pending the collection

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of subscriptions; but he was led to believe that the cost of publication was never fully met by the sales, so that a certain loss might be anticipated, but not of any large amount.

After some conversation, in course of which the editor was complimented on the scientific character of the Journal, regret was expressed that it did not contain fuller reports of the proceedings of the Society, and it was decided to refer the matter to the Committee of Correspondence.

The next business was the motion standing in Mr. Garnett's name, that the society's subscription should be reduced.

Mr. Garnett stated that at a former meeting he gave notice of a resolution to the effect that the subscription in connection with the Society should be reduced to $10 for members and $5 for associates. At that meeting he endeavoured to point out to what a great extent the Society would benefit by such a move, by extending its usefulness, by putting it more within the reach of a larger number of the community, and by adding to its list of members, increasing the interest taken in the Society. Further discussion, it would be remembered, was postponed in order to conform to the rules of the Society. Well, if his resolution had done nothing else, it had had the effect of adding new life to the Society. Arrears of subscription had been accounted for to some extent and as much as $300 had been paid in in one day. Now, let him for a moment adapt his resolution to the circumstances of the case, and they should find that they had at present 163 ordinary members and 90 country members, in all 253 members, which at $10 each would give $2,530. They

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had 169 associates which at $5 would give $845, making a total of $3,375, which compared with their present income from this source of $5,040, would show a decline of $1,635, but which, deducted from their present annual surplus of $3,300, would still leave an annual amount to the good of $1,635. This was on the basis of the present list of members but surely it would be altogether against the laws of effect if with a reduced subscription the list of members was not very largely increased. He begged to move that the subscription be reduced to $10 for members and $5 for associates, for town and country members alike, from the 1st January next year.

Mr. Nind, who rose to second the motion, said that it was somewhat of a formidable pleasure to have to face the sea of faces he saw before him, especially when one was of rather a nervous temperament, but when he considered the immense amount of interest that had been excited by this resolution, he was sustained in endeavouring to add his quota to what had fallen from the lips of Mr. Garnett. After disposing of the several objections that had been raised to the motion at a former meeting, the speaker continued, Mr. Hodgson had also raised some objections at last meeting. "He felt perfectly certain," Mr. Hodgson was reported to have said, "that if the Government knew that the members of the society could afford to have a reduction of their subscription, the question would arise whether the Government should continue the subsidy which they were now giving the society." In other words, that meant that the Government would cease to subsidise this society if it found that it was endeavouring to extend its sphere of usefulness among other classes than those at present. He

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would say at once, however, that he did not think Mr. Hodgson could have meant that, nor could he believe for one moment that the Government, several members of which he saw present, would withdraw their subsidy just when the society was throwing open its doors to a larger number of people. Government should be strictly impartial, but if it were to side with a party, it would naturally side with the poor rather than with the rich. Governments in these days had to show a justification for their existence, and the Government ought to be able to show that it exists, not for the good of a class, but for the good of all those it governs; and he believed the Government of this colony too was ready to take that view. In fact, his opinion was that there were members of the Government sitting in the Court of Policy who, far from wishing to withdraw the subsidy paid to the Society, if the society had 400 members, would rather say, "we would give you a capitation grant for every member you get beyond the present number of enrolled members;" and in that way too they might very well push forward the interests of the colony to a true development, because it was only through public institutions of this kind that the Government could do any real good.

Rev. John Foreman said that as a country member of eighteen years' standing, while he agreed with the principle which Mr. Garnett had laid down, he could not agree with the terms of the motion itself, whereby town members would receive a reduction of $6, associates of $3, and country members of only $2. He thought, if the principle of reduction were to be admitted, it should be carried out systematically over the three grades which now existed; and therefore, he moved as an amend-

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ment that there should be a reduction of 25 per cent, on the present rates of subscription.

The amendment was not seconded.

Mr. Hodgon ssaid, he should vote against the motion, especially as he wished to support the directors, who he believed had done honest work for the society, although, perhaps, with one or two matters they had not carried out the objects for which the society was primarily formed, notably the offering of premiums for Agricultural purposes which heretofore had been left to the generosity of a few individual members.

Mr. Davis said that Mr. Hodgson had complained that the motion brought forward by Mr. Garnett took rather the form of a vote of censure on the board of Directors; but so far from this being so, the censure came from Mr. Hodgson himself who had pointed out that the Directors had neglected to offer premiums for certain objects, or to establish an experimental garden, as provided for by one of the bye-laws. He was not aware that the Directors had ever carried out this bye-law, and it seemed to him that this point that had been raised at the present meeting as well as at a former one, was very much like a red herring being drawn across the trail. Undoubtedly this society had been suffering from being over rich,—disgustingly so. According to the statement laid over at last meeting, the cash in hand on the 30th June was $1,463, while the arrears of subscriptions amounted to $5,163. Adding these sums to the $900, which were lent for a purpose that had been named, and to the $1,900, lost by Messrs. Ridgway's failure, the total was $9,426. So that if the finances had been carefully managed, the Society should have had £2,000 at its

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credit at the present time, and no doubt the Directors could have done great things with such a balance. He found that a great number of people, and some of them very intelligent people though poor, were very anxious that the rates of subscription should be reduced, and believing as he did that the society required to have new blood infused into it, he should support the motion.

Mr. D. C. Cameron in supporting the spirit of the motion, moved as an amendment, that the rates for town members be reduced from $16 to $10, of country members from $12 to $8, and of associates from $8 to $5; which he thought would be dealing justly and equally with all grades.

Rev. J. Foreman seconded the amendment.

The President said that before putting the motion to the vote, he would like, as President of the society and as having been connected with it for very many years, to explain his position there and also to say something about his brother Directors. It must be gratifying indeed to members of the society met here to-day to be told that the society was possessed of such a plethora of wealth as to be described as disgustingly rich. He could only tell members that when he joined the society and was asked to accept the President's chair, the then Secretary, the late Mr. W. H. Campbell, who took a warm interest in and did much to advance the position of the society, came to him and said, "Mr. Russell, unless you can do something to put life into the dry bones of the society, we are going to be hopelessly bankrupt." Such was the state of the society. He promised to do what he could as the President, and according to his lights he infused a little fresh life into the society. They were

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not then in a position to act as Mr. Davis had pointed out was the duty of the society, but private individuals filled that gap and offered premiums for years for various subjects in connection with agriculture, and by degrees got the overseers throughout the length and breadth of the land to take a greater interest in the society. He believed that through those means new life was infused into the society, and partly accounted for the large surplus in the hands of the Treasurer. He said that if that surplus had been available 10, 15, or 20 years ago, there would have been established in connection with the society such works as Mr. Darnell Davis had alluded to, and which the Directors had been blamed for not establishing, but in those days the society instead of "suffering" from a plethora of wealth, lived as it were from hand to mouth. At the present time, he felt that they were very remiss in not doing more than they had done but it seemed entirely due to this being a Commercial and not an Agricultural Society. He thought the word "agricultural" should be expunged from the name of the society altogether, so little was the interest evinced when agricultural topics came to be considered, but now that a commercial topic like pounds, shillings and pence had to be considered to-day, gentlemen were found forsaking their business, even on mail day, to come here and vote in favour of reduction. He only trusted that the reduction of the rate of subscription would have the effect of introducing new brooms into the Society, and he could only say that the present directorate would be very happy indeed to hand over their batons to their successors. Mr. Nind had referred to the glowing articles which had appeared in the local press as regards

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the past of this great society. Now, he (Mr. Russell) had been here for nearly 40 years, and must say that in his early connection with the society, it was just about as dead as it was possible to be. This would also apply to the earlier stages of the existence of the society, except perhaps for a year or two when Croal and Stuart, giants of that age, took an interest in it; but the society had done more within the last ten or fifteen years, to be an Agricultural Society, or what he would like to see it, a "farmers' club," than all the time before. So that he could not allow it to go through the press to the public that the directorate of the society was effete and played out. He said that the society was now in a better position than at any previous time since its formation.

On a show of hands being taken there voted,

For the amendment 18
Against... 27

Mr. Garnett's motion was then put and carried, with only 3 dissentients.

The Secretary was instructed to advertise the alteration of by-law in the Official Gazette in accordance with the ordinance.

At this stage of the meeting a large number of members left the room, and it was with some difficulty a quorum could be maintained, the President remarking that now the commercial question was decided, only the agricultural interest was left to complete the business of the meeting.

Col. Figyelmesy conveyed by letter his thanks for the honour of election as an Honorary Member.

Letters were read from Mr. Hawtayne of 14th and 20th August and 13th Sept., referring to various matters

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of interest in connection with the Colony's exhibits of Drugs, Fibres and Woods at the Indo-Colonial Exhibition, and forwarding a paper descriptive of the increasing trade in "Kapok" the fibre of the Silk Cotton tree, now being used extensively for upholstery work.

An offer, conveyed through the Colonial Office, of valuable works by the late Lord Vernon—the "Inferno of Dante" and the "Prime Quattro Edizioni della "Divine Commedia"—to be presented by the Dowager Lady Vernon to certain public libraries on certain conditions, was accepted, with thanks to His Excellency the Governor for naming the Society as a recipient.

The Society's thanks were accorded for Commercial Reports, reports on the Cyprus Locust War, reports on Agricultural experiments on Sugar growing in British Burmah and Barbados, forwarded through the Government Secretary's Office.

A letter was read from the Secretary of the Anthropological Society of Vienna, thanking the Society for *Timehri*, and asking for some missing back numbers of that publication. The Secretary was directed to forward the numbers referred to if procurable.

The meeting then closed.

Meeting held 11th November.—Mr. H. Kirke, Vice-President in the chair.

There were 20 other members present.

Election.—*Associate :* H. T. Williams.

Before confirmation of minutes, the Chairman read a letter from Mr. John Minty of Pln. *Uitvlugt*, enclosing minutes of a meeting of members held on the West Coast

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on 18th October, calling in question the fairness and regularity of Mr. Garnett's motion anent the reduction of subscriptions as regards country members.

The Revd. J. Foreman also spoke to the same effect, but Mr. Garnett having explained that his original motion had been amended, the Chairman ruled that it was quite in order.

The Secretary announced the resignation of Mr. im Thurn as editor of *Timehri*; also the resignation by Mr. Godfrey of his office as director and of Mr. Russell as President and also as a member of the Society. In his letter the President said :—

"The unfavourable strictures made against the action of the Directors, and the warm way in which they were accepted by the very large meeting, was felt very keenly by me—hence the few words I expressed in defence, and how ready we would be to hand over our batons of office to the new brooms who were held up to work wonders by means of new blood. I had intended to remain out my term of office as President, and then quietly retire, at same time scratching my name as a member.

"My connection with the Society from first to last was purely in the interests of agriculture, and I never made use of the library in any shape; and now that I feel that agriculture with our good intentions of practical tests in laboratory experiments are things of the past, I cease to have any further interest in the Society.

"The resignation of Mr. im Thurn and my brother Director, Mr. Godfrey, makes me feel that with my many engagements in this busy season it will be more convenient for the Society to at once fill the President's chair. So please intimate my resignation as President and my withdrawal from membership."

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The Secretary said there had been no meeting of directors since these resignations had been sent in, and therefore by direction of the Vice President he had brought them before the General Meeting.

Mr. Darnell Davis thought Mr. Russell, who had spent his money and his valuable time freely upon the Society, deserved complimentary recognition of his services, and suggested his election as an Honorary member.

Mr. Foreman and Archdeacon Austin suggested that Mr. Russell be asked first to reconsider his decision.

On the Chairman's suggestion the matter was left to be dealt with by the directors.

The following notices of motion were given :—

By Archdeacon Austin :—

That the Directors of the Royal Agricultural and Commercial Society be requested to take steps to have the rooms opened on each evening of the week, except Sunday, between the hours of 7 p.m. and 10 p.m.

By Mr. Darnell Davis :—

To move at the next general meeting, for the names of any members of the Book Committee who have not attended a single meeting of that Committee from their first appointment to the present time.

On the suggestion of the Secretary this notice was subsequently altered to extend over a period of two years only.

By Revd. J. Foreman :—

To amend bye-law No. 2 in chapter v. on page ix. by erasing the words "sixteen" in the second line, and "twelve" in the sixth line, and by inserting "ten" in the place of the former, and "eight" in the place of the latter word.

2. To amend bye-law No. 4 of the same chapter by erasing the word "eight" in the second line, and by inserting the word "five" in its place.

3. To amend bye-law No. 15, chapter v, page x, by striking out the word "three" in the fourth line and instead thereof to insert the word "two."

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By Mr. Darnell Davis :—

To move at the next general meeting, that the subscriptions of members and associates shall, from 1st. of January, 1887, be payable quarterly in advance, and that the respective Bye-Laws be altered accordingly.

By Mr. J. Minty :—

1. That of the balance in hand of the funds of the R. A. and C. Society at the end of the present year 1886, the sum of three thousand dollars ($3,000) be reserved for the purposes described in chap. xiv, Premiums, (page xvii) of the bye-laws and rules of the R. A. and C. Society, and that the Directors be requested to devote their attention thereto early in the ensuing year, 1887.

2. To erase sec. 11 page 20 of the bye-laws of the R. A. and C. Society.

By Mr. C. H. G. Legge :—

1. That the bye-laws and rules of the Society restricting "associates" to certain classes and to persons whose income does not exceed £300 per annum be rescinded and that the byelaws and rules relating thereto be altered accordingly.

2. That the ordinary members of the Society should have the privilege of taking out a larger number of volumes of books than now allowed, that the distinction between "ordinary members" and "associates" should be that "associates" will only be entitled to the use of the Library and Reading Room, and that the byelaws and rules relating thereto respectively be altered accordingly.

Mr. N. D. Davis called attention to the inconvenience of the present hour of meeting, but the chairman explained that the early hour was arranged for the convenience of country members, in which view those present concurred.

Letters from Mr Walker, Resident Director, London, were read, one of them referring to the proposed Imperial Institute and to Ridgway & Co's bankrupt estate. Regarding the latter Mr. Walker wrote :—

I have to report for the information of the Directors that in consequence of receiving the accompanying circular from Mr. Lowell Price,

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the Trustee in Ridgways' bankruptcy, I attended the meeting of creditors held yesterday at the Guild Hall Tavern, but as I was unable to remain to the close of the proceedings, I am unable to state what the decision may have been. General Kay, however, on the part of the Committee of Inspection, made statements seriously impugning the conduct of the Trustee, and I can hardly doubt that his resignation would be accepted. I shall, of course, forward any further information which may reach me. Meanwhile I regret to be obliged to add that nothing transpired to warrant any sanguine anticipations of a satisfactory result to the winding-up of the estate. I may mention, amongst other statements made by General Kay, that the Solicitor to the Trustees' taxed bills of costs amounted to close upon £2,000 and that the Board of Trade has sanctioned a review thereof; and that Colonel Ridgway and his family had been allowed to continue in possession of the Devonshire estate called Shopley Court, with the use of carriages, horses, servants, and grounds until a comparatively recent period.

Letters from Mr. Hawtayne, C.M.G. Commissioner at the Indo-Colonial Exhibition, giving information regarding the breeding of silkworms, Tobacco culture, exchange of Museum specimens with kindred institutions &c., were laid over. The papers relating to the minor industry were on the suggestion of the Secretary referred to the Agricultural Committee, and the thanks of the Society were directed to be conveyed to Mr. Hawtayne for his communications.

Regarding the possibility of introducing silk culture as a minor industry into this colony, Mr. Hawtayne wrote as follows under date of 24th Sept:—

"Mr. Wardle, Honorary Superintendent of the India Silk Culture Court, is taking great pains to extend the culture of silk worms and strongly recommends that the subject should be brought under the notice of the Royal Agricultural and Commercial Society because he believes that silk could be produced in British Guiana, and because it is an employment, a small industry, which can be undertaken by small capitalists and land owners.

The entomological specimens exhibited in our Court are not nume-

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rous, and are not accompanied by drawings and descriptions of the pupæ and larvæ of the several moths and their respective food plants, but I have no doubt that a collection of moths and cocoons with the plants on which the larvæ feed could be readily obtained with the assistance of Mr. Quelch and the Revd. Mr. Harper, and such a collection Mr. Wardle has kindly offered to examine and report upon.

One British Guiana moth (of which I send a specimen) was stated by Mr. Wardle to be a silk-worm moth and it would be advisable to procure its cocoon and larvæ (the latter in spirit) and its food plant and send to Mr. Wardle.

Many of the plants which in India support the silk worm are to be found in British Guiana.

If the indigenous silkworms are found to be from any cause undesirable subjects for culture, it would be by no means difficult to import eggs from France, Italy, Japan, and China as is done in India.

Owing to an improved method of winding, silk has increased in value and there is a growing demand for it, indeed this afternoon as I accompanied Mr. Wardle round his court a large silk spinner came up and gave an order for 1,000 lbs. of one kind. The machine for winding is simple and inexpensive. I send herewith for presentation from me to our library two books on Indian Silk culture and the wild silks of India, and I shall be glad if the subject recommends itself to the attention of the Society, and if so, I would suggest that a committee might be appointed to collect materials and information which might be submitted to Mr. Wardle as before mentioned. Mr. Quelch and the Rev. Mr. Harper with any other entomologists resident in the colony might be asked to search for silkworm moths &c. and Mr. Jenman would no doubt supply information as to the plants to be found in the colony which are the same as, or similar to, the food plants mentioned in the hand books. Terminalia Catalpa—Ricinus Communis Lagerstrœmia—are more or less common in the colony and as the mulberry grows readily in the West Indies it may possibly succeed with us. Even if silkworm culture should not become a recognized industry, it may well become a profitable employment—amusement, hobby if you like, to those who require and would appreciate an interesting occupation.

Mr. Wardle's address is Thomas Wardle Esq., F.C.S., F.G.S., Leek, Staffordshire."

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The Secretary stated that the books and specimens referred to by Mr. Hawtayne, had not yet come to hand.

The Chairman reminded members that the meeting next month would be the annual one at which office bearers and committees were selected and he hoped there would be a large attendance of members prepared with nominations for the various offices.

The thanks of the Society were accorded to Mr. Fresson and to Colonel Figyelmesey for their contributions of "A Voice from the Woods" and an illustrated catalogue of sugar machinery manufactured in the United States.

The meeting then terminated.

Meeting held 9th December.—Mr. H. Kirke, Vice-President in the chair.

Elections.—*Ordinary Member :* R. O. Sherrington.

Associates : F. Curtis and F. W. Hopkinson.

The name of Mr. Thomas Woodman, of pln. *Mon Repos*, was also submitted ; but in consequence of irregularity in the seconding, this election was postponed.

The Chairman stated that the Directors had, in accordance with the wish expressed at the last meeting, communicated with the Hon. Wm. Russell, and Mr. im Thurn, requesting them to withdraw their resignations, but both gentlemen had declined to do so ; the former also declined to allow himself to be nominated for election as an honorary member of the Society.

Archdeacon Austin then moved the resolution of which he had given notice, that the reading room be open on

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each evening of the week, except Sunday, between the hours of 7 and 10. Mr. N. Darnell Davis seconded the motion, which was supported by Mr. Drysdale, the Rev J. Foreman, Mr. Legge and Mr. Daly. The latter, however, suggested that at first, and until it should be seen whether the experiment would answer, the rooms should be open on only three evenings per week; but Mr. Winter having pointed out the inconvenience likely to arise from intermittent opening, the suggestion was not favourably received. At the close of the discussion Mr. Davis said it had been suggested to him that to close the rooms at six o'clock and reopen them at seven would be both useless and inconvenient, and on the recommendation of the Chairman the resolution was altered so as to read "that the rooms remain open until 10 p.m. on every week day." Mr. Hutchens objected to the exception of Sunday. The rooms were now open from 7 a.m. to 4 p.m., on Sundays, and he saw no reason why the members of the Society should be debarred from the enjoyment on Sunday evenings of the beauties of literature and the treasures of art with which the rooms were stored; but the recommendation was not supported. The Archdeacon's resolution, as amended, was finally carried, there being only two dissentients. It was understood that the resolution was to be regarded merely as a recommendation to the Directors.—The three resolutions of which the Revd. Mr. Foreman had given notice, the effect of which will be to reduce the annual subscriptions of country members to $8, of associates (in town and country alike) to $5, and of naval and military officers to $2 per quarter, were duly moved by the revd. gentleman (the first two being seconded by Mr. Minty, and the

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third by Archdeacon Austin) and carried.—Mr. Davis brought forward the resolution of which he had given notice, that all subscriptions be payable quarterly in advance, and it was seconded by Mr. Younger ; but, after discussion, it was rejected by a large majority.—Mr. Minty then moved the resolution of which he had given notice, that of the balance of the funds of the Society at the end of 1886, $3,000 be set aside for the purposes described in ch. xiv. of the by-laws and rules of the Society, which relates to premiums for agricultural improvements. It was, he said, intended simply as a suggestion to the Directors. Mr. Bellairs seconded the motion. The Rev. Mr. Foreman explained that the proposition had arisen out of a conversation among a number of members of the Society respecting a recent remark of the Hon. Mr. Russell to the effect that the Society ought no longer to be called an Agricultural Society, inasmuch as it had done nothing to promote agriculture. Captain Duncan said it would be unsafe to set aside such a sum as $3,000 for any particular purpose without first knowing the actual financial position of the Society at the end of the year, as possibly the funds might not be able to afford it. The Secretary (Mr. Luke M. Hill) having pointed out that the Directors had already committed themselves to certain expenditure in connection with the re-classification of the library, publication of a new catalogue, renewal of pavements, &c., which together would cost a considerable sum, suggested that "a sum of money" should be substituted for a fixed sum of $3,000. Mr. Minty having agreed, the resolution, so amended, was carried.—So also was the further resolution of which Mr. Minty had

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given notice, the effect of which will be to place country members on more even terms with town members in the procurement of books from the library by doing away with prior engagements. The resolution of which Mr. Legge had given notice—that the bye-law restricting associates to persons whose income does not exceed £300 per ann. be rescinded, having been seconded by Archdeacon Austin, was discussed at some length, being supported by Messrs Colbeck and Davis, and opposed by Rev. J. Foreman and Mr. Bellairs, but decision upon it and Mr. Legge's other motion was postponed until the next meeting, when the possible effect of their adoption on the income of the Society may be more approximately estimated.

The election of officers and committees for the ensuing year was then proceeded with.

On the motion of Mr. D. C. Cameron, seconded by Archdeacon Austin, Mr. Henry Kirke, M. A., was unanimously elected President. In returning thanks for the compliment, Mr. Kirke said he felt it the more because he had lately expressed opinions contrary to those of the majority of the members of the Society; but he had done so honestly, believing that what was proposed would not be advantageous to the Society. Now, however, that the resolution had been adopted, he should bow to the decision of the majority and loyally endeavour to do his best to promote the interests of the Society. Mr. P. H. Nind was elected Vice President being proposed by Mr. Daly and seconded by Mr. Drysdale. Messrs. B. H. Jones, R. J. Kelly, G. H. Hawtayne, C.M.G.; R. P. Drysdale, S. M. Bellairs and Alex. Duncan, Ordinary Directors; Messrs. J. S. Hill, M. Garnett, and D. C.

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Cameron, Managing Directors; Messrs. J. J. Dare, T. H. Glennie and A. Weber, Exchange Room Directors.—In relation to the election of Treasurer, Mr. Daly said he had received a letter from Mr. Imlach who stated that he did not wish to be re-elected. He (Mr. Daly) therefore proposed that Mr. Conyers be elected Treasurer for the ensuing year. Mr. N. D. Davis seconded the motion. Mr. Conyers said he did not think the time had yet come to elect another person in place of Mr. Imlach, who had been connected with the Society ever since its foundation, and had done much to promote its success. Mr. Imlach had probably written the letter to which reference had been made, under the influence of irritation, caused by what he had seen in the newspapers about the lax way in which the collection, or non-collection, of subscriptions had been conducted, and on calm reflection might think better of it. He was quite willing to continue to act as Treasurer until Mr Imlach returned, and if, then, Mr. Imlach should persist in declining re-election he would be prepared to undertake the office. He, therefore, begged to move as an amendment that Mr. Imlach be re-elected as Treasurer. Mr. D. C. Cameron seconded the amendment, which was adopted unanimously. Mr. L. M. Hill was re-elected Secretary, and Mr. William Walker, Resident Director in London, a special vote of thanks for his past services in that capacity being passed. A similar compliment on the motion of Mr. Davis seconded by Capt. Duncan was paid to the retiring office-bearers of the Society. The various Committees for the ensuing year, of which a complete list will be found at foot were appointed.

A letter from Mr. Russell, enclosing cuttings from

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newspapers and letters received by him from Engineers in the States, showing that the attention of American inventors and manufacturers of agricultural implements and machinery is at length being attracted to the offer of a reward of $100,000, made by the Legislature of this colony some years ago, for implements and machinery suitable for cane cultivation in the colony; also a letter from Mr Ellis (said to have been a sugar planter in Surinam, who claims to have designed suitable ploughs, reaping, collecting, and traction machines, and is now in the colony) were laid over and referred to the Agricultural Committee. At half-past five (having lasted nearly two-and-a-half hours) the meeting broke up, the business undisposed of being postponed until the next ordinary meeting.

The following are the Society's Office-bearers for 1887, as finally arranged:—

Patroness:

THE QUEEN.

Vice-Patron:

HIS EXCELLENCY SIR HENRY TURNER IRVING, K.C.M.G.,
GOVERNOR AND COMMANDER-IN-CHIEF, &c., &c., &c.

President:
HENRY KIRKE.

Vice-President:
P. H. NIND.

Managing Directors:
D. C. CAMERON
M. GARNETT
J. S. HILL.

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Ordinary Directors :

S. M. BELLAIRS
R. P. DRYSDALE
ALEX. DUNCAN
G. H. HAWTAYNE
B. HOWELL JONES
R. J. KELLY.

Exchange Room Directors :

JOHN J. DARE
THOS. H. GLENNIE
ARTHUR WEBER.

Treasurer :

F. A. CONYERS.

Secretary :

LUKE M. HILL.

Agricultural Committee :

R. J. KELLY, *Chairman.*
A. BARR, *Vice-Chairman.*
D. C. CAMERON, *Hon. Secretary.*

HON. C. L. BASCOM
S. M. BELLAIRS
HON. A. BRAUD
B. R. CLARKE
HON. WM. CRAIGEN
R. P. DRYSDALE
J. M. FLEMING
MEWBURN GARNETT
A. R. GILZEAN
E. C. LUARD
JOHN MINTY
JOS. MONKHOUSE
GIBSON MONRO
MALCOLM MONRO
P. H. NIND
RASHLEIGH PORTER
W. H. SHERLOCK.
HENRY T. STOKES.

Committee of Correspondence :

D. C. CAMERON, *Chairman.*
R. T. A. DALY, *Vice-Chairman*
F. A. CONYERS, *Treasurer.*
J. J. QUELCH, *Secretary.*

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His Hon. N. ATKINSON	J. S. HILL
G. A. FORSHAW	W. H. HILL
E. E. H. FRANCIS	R. W. IMLACH
WILLIAM FRESSON	G. S. JENMAN
M. GARNETT	R. J. KELLY
GEO. GARNETT	GEORGE LITTLE Jr.
B. J. GODFREY	F. A. MASON
G. H. HAWTAYNE.	P. H. NIND

Curator of Museum : J. J. QUELCH.

Book Committee :

Dr. F. ANDERSON	G. GARNETT
His Hon. N. ATKINSON	FERRIS GRANT
Ven. Archdn. AUSTIN	G. H. HAWTAYNE
B. S. BAYLEY	W. H. HILL
Rev. Canon CASTELL	R. W. IMLACH
R. A. T. DALY	C. H. G. LEGGE
F. E. DAMPIER	P. H. NIND
N. DARNELL DAVIS	J. A. POTBURY
Dr. Alex. FINLAYSON	JAS. THOMSON
Rev. J. FOREMAN	F. A. R. WINTER

Librarian : CHARLES CRUMPTON.

Resident Director in London :

WILLIAM WALKER, 48 Hilldrop Road, Tufnell Park, N.

LUKE M. HILL,

Hony. Secretary.

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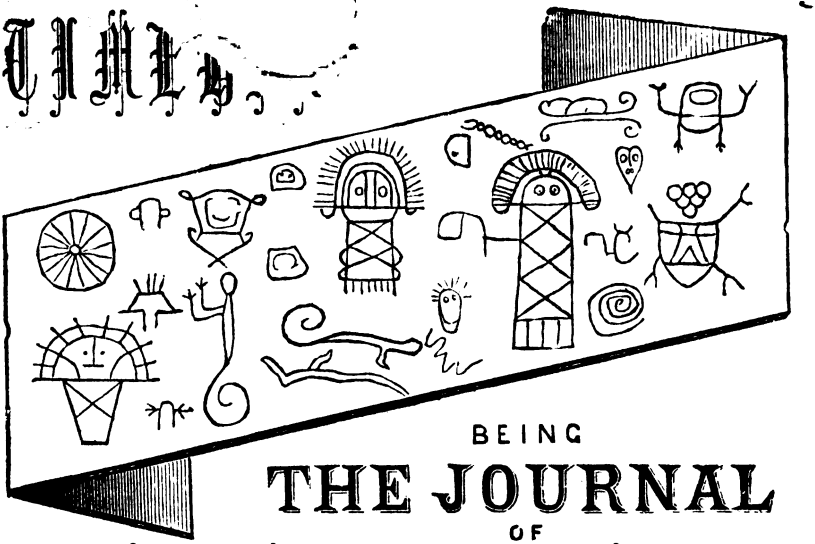

BEING

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